Supreme Court, U.S.
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In The

Supreme Court of the United States

John Dash, *Petitioner*

v.

Jon W. Dudas, Director of the USPTO,
Commissioner of Patents and Trademarks,
Respondent

On Petition for a Writ Of Certiorari
To United States Court Of Appeals
For The Federal Circuit
04-1145
(Serial No. 08/439,712)

IN RE JOHN DASH

Appeal from the Board of Patent Appeals

And Interferences

(No. 1998-1918)

PETITION FOR A WRIT OF CERTIORARI

John Dash, Ph.D.

313 N. Holman St.

Portland, OR 97217

May 9, 2005

503-725-4222

QUESTIONS PRESENTED

The Constitution of the United States states that the Congress shall have the power to promote the progress of science and useful arts. The question presented is whether the USPTO ***promoted*** or ***hindered*** the progress of science in an invention related to the ***cold fusion*** phenomenon.

Title 35 of the United States Code states that an inventor who discovers a new and useful process may obtain a patent provided that the claimed results can be reproduced by a person skilled in the art to which it is most closely connected. The question presented is whether the USPTO rejected the patent application of the Petitioner simply because he suggested that the claimed results were related to the ***cold fusion*** phenomenon.

Did the USPTO discriminate against the inventors because they suggested that their discoveries are related to the ***cold fusion*** phenomenon, whereas another inventor with similar discoveries was granted patents ?

LIST OF PARTIES

Not all parties are listed on the cover page of this case. The list of all parties involved in this matter is as follows:

Petitioner, previously Applicant, then Appellant, Professor Emeritus John Dash, 313 N. Holman St., Portland, OR 97217. The name of the real party in interest represented by the Petitioner is: Electrochemical Innovations, Inc. by assignment from the inventors (reel 5292, frames 494-497). There is no parent corporation or any publicly held company that owns 10 % or more of the stock.

Respondent is the Office of Patents and Trademarks (the U.S. Patent and Trademark Office and the Board of Patent Appeals and Interferences). The Examiner has been Mr. Harvey E. Behrend. Mr. Jon W. Dudas, is Director of the USPTO.

The Respondent's attorney of record is Solicitor John M. Whealan. With him are Associate Solicitors Thomas W. Krause and James R. Hughes. Their address is P.O. Box 15667, Arlington, VA 22215.

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OPINIONS BELOW

The opinion of the court of appeals [United States Court of Appeals for the Federal Circuit (CAFC) appears at Appendix A to this Petition.

The opinion of the Board of Patent Appeals and Interferences of the United States Patent and Trademark Office (Board) appears at Appendix B to this Petition. Comments on the Board's references appear at Appendix C.

JURISDICTION

The jurisdiction of this Court is invoked under 35 U.S.C. § 101 and 35 U.S.C. §112 and the Constitution Of The United States, Article I, Section 8, Clause 8.

CONSTITUTIONAL AND STATUTORY PROVISIONS INVOLVED

The Constitution of the United States of America, Article I, Section 8, Clause 8 states: "The Congress shall have Power To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries".

Statutory sections from 35 U.S.C. are also applicable:

§101. Inventions patentable.

"Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title".

§112. Specification (first paragraph).

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The policy of the USPTO is that the claimed phenomenon called ***cold fusion*** is not credible (Appendix D). Therefore, any claimed discovery related to ***cold fusion*** also is not credible, and it is not possible to satisfy 35 USC § 112. Such claimed discoveries cannot be patented. Appendix E contains a statement by a U.S. Navy scientist, ..."we do know the existence of Cold Fusion phenomenon through repeated observations by scientists throughout the world". Apparently, the USPTO does not accept the opinions of respected Federal scientists.

BASIS OF FEDERAL JURISDICTION IN THE COURT OF FIRST INSTANCE

Federal jurisdiction is authorized by the U.S. Constitution, Article I, §8, cl. 8, and by 35 U.S.C. § 101 and § 112.

This application (08/439,712) is a continuation of application 07/996,967, filed December 23, 1992, now abandoned, which is a continuation of application 07/509,585, filed April 16, 1990.

In Appeal No. 1998-1918, The Board of Patent Appeals and Interferences affirmed the the grounds of rejection of appealed claims 4 through 11, under 35 U.S.C. § 112, first paragraph, and under 35 U.S.C. § 101. The Board also reversed the ground of rejection of appealed claims 4

through 9 and 11 under 35 U.S.C. § 112, first paragraph, written description requirement, and of appealed claims 4 through 11 under 35 U.S.C. § 103 and under 35 U.S.C. § 102(a,g) This decision was mailed on September 30, 2003. This opinion is ***not*** binding precedent of the Board (Board's emphasis).

Petitioner then filed a timely appeal of the Board's decision to the United States Court of Appeals for the Federal Circuit, No. 04-1145. Petitioner requested oral argument under Fed. R. App. P. 34(a)(1), but it was denied. On December 10, 2004, the Court of Appeals affirmed the Board's decision. **This opinion is not citable as a precedent**. (Petitioner's emphasis). The Office then petitioned the Court to make its opinion a citable precedent. The petition was denied.

CONCISE STATEMENT OF MATERIAL FACTS

The present invention provides a method for generating heat energy using an electrolytic cell having a palladium sheet cathode and an inert anode. The invention uses an electrolyte composition that principally contains sulfuric acid and D_2O. A sufficient amount of the electrolyte composition is placed in an electrolytic cell to at least partially cover a palladium sheet cathode and an inert anode. A voltage is then applied across the electrodes. The result is the production of heat energy, the evolution of hydrogen, deuterium and oxygen gases, and the possible recombination of these gases to form heavy water.

The Petitioner became involved in ***cold fusion*** research a few weeks after an announcement by University of Utah chemists Fleischmann and Pons on March 23, 1989, that

nuclear fusion could be achieved near ambient temperature by electrolysis of heavy water with a palladium cathode. Professor Takeo, chair of the Portland State University (PSU) Physics Department, asked the Petitioner, Professor John Dash, to investigate the phenomenon based on his 30 years of experience in aqueous electrolysis. Professor Dash and graduate student Patrick Keefe designed an apparatus and electrolyte composition that differed from that of Fleischmann and Pons in several important respects including, for example, the structure of the cathode and the composition of the electrolyte.

The inventors noted that the Pd cathode became quite distorted after short electrolysis periods, possibly due to hydrogen isotopes that formed on its surface, and subsequently became embedded in the Pd foil. The Pd cathode was analyzed using a scanning electron microscope (SEM), and evidence was found suggesting that localized melting had occurred on the surface. Patrick Keefe detected heat production from similar experiments, and wrote his M.S. thesis describing these results. Elizabeth Nicholas, in later trials, also confirmed the production of heat, where the total electrolysis time performed was approximately 600 hours. She wrote her M.S. thesis about these results. Grant Noble thoroughly characterized electrodes used by Mr. Keefe and Ms. Nicholas using an SEM equipped with an energy dispersive spectrometer. Mr. Noble detected localized concentrations of gold intimately associated with platinum on the surface of the palladium. He wrote his M.S. thesis about these results, postulating that the occurrence of gold was due to transmutation of platinum (a nuclear fusion reaction) on the Pd surface. Daniel Diman performed additional trials in which localized concentrations of silver were found on the Pd surface, possibly by transmutation of Pd (a nuclear fusion reaction).

The Petitioner and co-inventor Patrick Keefe filed U.S. Patent Application No. 07/509,585 (the '585 application) on April 16, 1990. This application was appealed to the Board, and on November 24, 1992, the Board sustained the Patent Office rejections. *Ex parte Dash*, 27 U.S.P.Q.2d 1481 (Bd. Pat. App. & Int., 1993).

On December 23, 1992, the inventors filed U.S. (continuation) Application No. 07/996,967 (the '967 application) to begin developing a better record for appeal, possibly to the Federal Circuit. Professor Dash has since retired, as this strategy required twelve years to implement.

The Petitioner was unable to convince Examiner Behrend to withdraw his rejections cited against the '967 application. The Petitioner therefore requested, and was granted, an Examiner's interview to discuss the results of record and to demonstrate to Examiner Behrend a palladium cathode and other materials used to practice the claimed invention. The interview was scheduled for November 22, 1994. Examiner Behrend first demanded that the Petitioner provide a statement confirming that items presented during the interview would not emit dangerous levels of radioactivity.

Perhaps Examiner Behrend gave more credence to the occurrence of nuclear fusion events than admitted in official correspondence.

Furthermore, Examiner Behrend stated that he would accept an opinion from a reputable scientist and laboratory as sufficient evidence supporting the operability of the petitioner's system if such laboratory had previously stated that it had found no positive evidence of operability. The Petitioner had previously visited Dr. Miles at the Research and Technology Division of the Naval Air Warfare Center Weapons Division, China Lake, CA, who had worked on similar technology beginning in 1989, but had obtained

only negative results for several months. These results were cited by the DoE in its 1989 review of ***cold fusion*** research. Dr. Miles agreed to test Professor Dash's system, and he published the results on heat output in Fig. 16, NAWCPPNS TP8302 (Appendix F). When questioned about Fig. 16, Dr. Miles issued the following statement : "Apparently the caption is wrong. The graph is correct. The caption should have stated that all points were within +/- 50 mW. The graph suggests a possible small excess power effect. However, my experimental error was +/- 20 mW, hence I did not claim excess power unless it reached 60 mW to give a 3 sigma effect. These experiments differed from my normal studies due to the high conductivity of the electrolyte. This made the input power much smaller than normal, thus higher currents were needed to reach my usual operating temperatures".

Dr. Miles only considered data statistically significant at 3σ, not 2σ, as would normally be accepted by a person of ordinary skill in the art.

In his first experiment on our system, Dr. Miles also detected ionizable radiation emanating from a cell (p. 27, TP8302). This is not possible unless a nuclear reaction is occurring. Thus, Dr. Miles achieved positive results on our system even though our protocol was not followed exactly (Appendix G). However, Examiner Behrend did not accept this interpretation of the Miles' results. Instead, Behrend concluded that Miles' results proved that our system is inoperable.

DISCUSSION OF QUESTIONS PRESENTED

Did the USPTO comply with the spirit of the Constitution of the United States ?

Article I, Section 8, clause 8 : " The Congress shall have Power To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their Writings and Discoveries".

The USPTO (Office) is the arm of government which secures these rights (patents) for individual authors and inventors. In the case presented here, the evidence shows that the Office **hindered** rather than **promoted** the progress of science. Although there are hundreds of published reports of positive results on one or more aspects of cold fusion (see <lenr-canr.org>), the Office never acknowledged any of them during the past 15 years since our first patent application for a unique ***cold fusion*** process. In addition, the Office was informed of a peer-reviewed paper in a prestigious scientific journal which showed that studies relied on by the mainstream scientific community contained serious errors which undermined the conclusion that no excess heat was produced in cold fusion experiments. This paper was completely ignored by the Examiner. The Board decision, p. 2, states, "We cannot find where the document Melvin H. Miles et al., "Calorimetric Principles and Problems in Measurements of Excess Power during Pd-D_2O Electrolysis," *Journal of Physical Chemistry*, February 17, 1994, p. 1948-52, also cited in appendix B of the supplemental brief, has been entered in the record and considered by the examiner". There were long delays in processing our application due to loss or misplacement of the materials we submitted to the Office. In addition, the Examiner was extremely slow in submitting his answers. The record of the Office in handling our application clearly does not comply with the spirit of the U.S. Constitution.

Did the USPTO comply with 35 U.S.C., § 101, Inventions patentable ?

"Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title".

It is well known to the community of scientists who study the cold fusion phenomenon that any patent application which makes claims which the inventors suggest are related to ***cold fusion*** is dead on arrival at the USPTO (Office). The application is sent to an examiner who has expertise in nuclear phenomena. Then the examiner employs tactics designed to kill the application. Every negative ***cold fusion*** report which has been published is cited against the application to justify the conclusion that the claimed invention is inoperable. Positive reports which have been published are never cited.

On the other hand, a patent application was filed which claimed excess heat from an electrolytic process, with no attempt to explain the origin of the excess heat. The application was assigned to a different examiner. A patent was then granted. James A. Patterson received U.S. patent 5,494,559, titled "System for electrolysis", in which claim 27 is for "A system for producing excess heat in a liquid electrolyte...". There is no attempt to explain the origin of the excess heat. This patent application was filed more than five years after our original U.S. patent application, in which we claimed a similar but unique process to produce excess heat, and we suggested that the source of the excess heat was some undetermined nuclear process. Patterson has received 11 other U.S. patents related to his "System for electrolysis" (Appendix J). In 1996, Professor George H. Miley from the

University of Illinois and Patterson published "Nuclear Transmutations in Thin-Film Nickel Coatings Undergoing Electrolysis", *Journal of New Energy,* vol.1, No.3, pp. 5-30 (1996). This was published about two years after our publication, "Surface Morphology and Microcomposition of Palladium Cathodes after Electrolysis in Acidified Light and Heavy Water: Correlation with Excess Heat", *Transactions of Fusion Technology,* vol. 26, pp. 299-306 (1994). Clearly, scientists who have attempted in their patent applications to explain the origin of the excess heat they observed suffer unfair discrimination. The Office **does not** comply uniformly with 35 U.S.C. §101.

Did the USPTO fairly evaluate the Petitioner's compliance with 35 U.S.C., § 112, Specification, first paragraph ?

"The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention"

The Facts above describe the work of Dr. Melvin Miles who results showed "possible evidence for small amounts of excess power" and anomalous radiation (Appendix G) from a cell with a thin foil palladium cathode which we supplied and a sulfuric acid-heavy water electrolyte. This occurred in his first experiment in which he used a platinum-rhodium anode instead of a pure platinum anode, which we specified (Appendix G). This shows that our experiment is very forgiving. Positive results were obtained in the first experiment even though the experimental protocol was changed.

Since 1990, seven students have completed M.S. theses and two students have completed Ph.D. dissertations on our system. All of them achieved positive results. The theses and dissertations were all approved by independent faculty examiners.

Starting in 1989 and continuing to 2004, two high school students worked in the Petitioner's laboratory as research apprentices two months during the summer. All 30 of them achieved positive results on our ***cold fusion*** system.In August 2003, three of these high school apprentices demonstrated our *cold fusion* experiment successfully in a laboratory at MIT. About 100 scientists observed the experiment, and no one disputed our claim that excess heat was produced.

Using the protocol which we provided, high school students in Asti, Italy and in Milan, Italy (Appendix H), and university students in Changchun, China duplicated our results in 2004 (Appendix I).

Clearly our specification is adequate for successful replication by people with a wide range of scientific training.

The position of the Office is that ***cold fusion*** is not credible, Therefore, it is impossible for any specification to satisfy U.S.C. 35, § 112.

An example of the Examiner's treatment of information is found in his Office Action dated October 25, 2004, in which he stated, " Even more critical evidence that applicants invention is actually not operative to produce heat can be found in NAWCWPNS TP 8302 dated Sept. 1996, which on page 27 states that no excess heat was found in a system utilizing cold-rolled palladium sheet cathodes and procedures supplied by [applicant] Professor John Dash".(Examiner's emphasis). The Examiner does not mention that Dr. Miles used a reactive anode which

apparently halted the early signs of excess heat (Appendix G). Nor does he mention that Dr. Miles detected anomalous radiation, which is also mentioned on page 27 of the above report. Anomalous radiation is one of the signature features of ***cold fusion***, and it was recommended by the December 2004 DoE review panel report that DoE should support research to detect and characterize this radiation. In other words, the Examiner never gives the whole picture. He just extracts the information which supports his position.

In a letter to the Petitioner dated February 12, 2005 (Appendix G), Dr. Miles wrote: "My two studies of your system had several serious flaws. Foremost was my use of Pt-20% Rh as the anode material". The Petitioner had used only pure Pt as the anode material, and he had so informed Dr. Miles. Dr. Miles further wrote, "In reviewing the experimental results for this study (Figure 16, p.66 of the NAWCWPNS TP8302 Report), there is possible evidence for small amounts of excess power over the first 5 or 6 days of this experiment. Apparently, the Rh dissolving from the anode and plating out on the cathode over longer time periods sequenced these early signs of excess power". Concerning these experiments on our system, Dr. Miles stated in the TP8302 Report, "Anomalous radiation, however, was observed in these experiments with the use of a new type of GM detector purchased from TGM Detectors, Inc. (TGM), Waltham, Massachusetts".

Does the USPTO discriminate against inventors who suggest that their discoveries are related to the *cold fusion* phenomenon ?

Our initial patent application on this invention, on April 16, 1990, was titled "Low Temperature Nuclear Fusion".

This title was chosen because we had detected the production of excess heat which was far greater than could be produced by any known chemical reaction, and we had also detected tritium production during our experiments. Tritium is a byproduct of nuclear fusion. Our application was assigned to an examiner with expertise in nuclear science. After the examiner denied a patent, we appealed to the Board which affirmed the decision of the examiner on November 24, 1992. We filed a continuation application with new data to fortify our claims on December 23, 1992. Again, the examiner rejected our application, which we then abandoned. On May 12, 1995, we again applied for a patent, again using new data to fortify our claims. After years during which our application materials were sometimes lost in the Office, the examiner again rejected our application. The Board affirmed the examiner's decision on September 30, 2003. CAFC affirmed the Board's decision on December 10, 2004.

The Patterson invention described above employs a thin film palladium cathode which is essential to obtain excess heat in a few hours after electrolysis starts. Our process also uses thin palladium for the same reason. In contrast to this, most other investigators used thick Pd which required days or weeks before excess heat is produced. Reproducibility with thick palladium cathodes is very poor, but it is very good when thin palladium (less than 0.5mm thick) is used. This is an essential factor in the inventions of both Patterson and the Petitioner., It is now 15 years after the petitioner's application was filed. Much new supporting evidence has been obtained, but the response of the Office is still negative. Apparently, our attempt to explain our discovery in terms of the ***cold fusion*** phenomenon was a fatal mistake, due to discrimination practiced by the Office.

SUMMARY OF THE LEGAL ARGUMENT

The claims must be construed properly before the utility and enablement requirements of 35 U.S.C. § 101 and 112 are considered. *Process Control Corp. v. Hydreclaim Corp.* 190 F.3d 1350, 52 U.S.P.Q.2d 1029 (Fed. Cir. 1999). It is improper to read limitations from the specification into the claims. *Loctite Corp v. Ultraseal, Ltd.*, 781 F.2d 861, 867, 228 U.S.P.Q. 90, 93 (Fed. Cir. 1998). Independent claims 6, 10 and 11 (A948-A947) as properly construed do not refer to "excess energy" or a "nuclear event." The Board's opinion (A1-A17) is based, at least in part, on an improper claim construction, and should be reversed for this reason alone.

The "use" requirement of section 112 "incorporates as a matter of law the requirement of 35 U.S.C. § 101 that the specification disclose as a matter of fact *a practical utility* for the invention." *In re Ziegler*, 26 U.S.P.Q.2d 1600, 1603 (Fed. Cir. 1993), citing *Cross v. Iizuka,* 753 F.2d 1040, 1042-44, 224 U.S.P.Q. 739, 741-42 (Fed. Cir. 1985). *In re Marzocchi* 439 F.2d 220, 223, 169 U.S.P.Q. 367, 369 (CCPA 1971). A specification need only describe a practical utility, but may describe more than one practical utility. *Raytheon Corp. v. Roper Corp.,* 724 F.2d 951, 220 U.S.P.Q. 592 (Fed. Cir. 1983).

The claims as properly construed have utility separate from heat production. For example, the application discloses that the claimed invention is useful for producing hydrogen and oxygen gases that can be collected for industrial purposes. Patent application, A26, lines 4-6. In addition, the method can be used to produce heavy water. Patent application, A26, line 3.

With reference to establishing utility of the claimed

invention by heat production, "only after the Patent Office provides evidence showing that one of ordinary skill in the art would reasonably doubt the asserted utility does the burden shift to the applicant to provide rebuttal evidence sufficient to convince such a person of the invention's asserted utility." *In re Brana*, 51 F.3d 1560, 34 U.S.P.Q. 2d 1436 (Fed. Cir. 1995). The Patent Office did not produce sufficient evidence to shift the burden to Professor Dash to produce rebuttal evidence because (1) the proffered information does not concern the invention as claimed, and/or (2) the cited documents present anecdotal information or are not peer-reviewed.

Even if, solely for the sake of argument, the Patent Office produced sufficient evidence, the inventors successfully rebutted the p*rima facie* case by submitting sworn declarations and documentary evidence clearly establishing that the claimed method reproducibly results in the production of heat energy. Appellants may be unable to provide a concise explanation of how their invention works, but they are under no legal obligation do so, as an applicant is not required to correctly set forth, "or even know how or why the invention works." *Newman v. Quigg*, 877 F.2d 1575, 1581, 11 U.S.P.Q.2d 1340, 1345 (Fed. Cir. 1989).

LEGAL ARGUMENT

A. STATEMENT OF STANDARD OF REVIEW

The Court of Appeals for the Federal Circuit reviews the legal conclusions of the Patent and Trademark Office *de novo*, and the underlying factual findings for substantial evidence. *In re Kotzab*, 217 F.3d 1365, 1369 (Fed. Cir. 2000). The "substantial evidence" standard asks whether a reasonable fact finder could have arrived at the Board's

decision. *In re Gartside*, 203 F.3d 1305 (Fed. Cir. 2000). Claim construction is a matter of law reviewed *de novo*. *Markman v. Westview Instruments, Inc.* 52 F.3d 967 (Fed. Cir. 1995) (*en banc)* aff'd S. Ct. 116 S. Ct. 1384 (1996); *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1456, 46 U.S.P.Q.2d 1169, 1174 (Fed. Cir. 1998). Determining whether the utility requirement is satisfied is a question of fact. *In re Cortright,* 163 F.3d 1353, 1356 (Fed. Cir. 1999). The statutory enablement requirement is a questionof law reviewed *de novo* by The Court of Appeals for the Federal Circuit based on underlying factual inquires. *Enzo Biochem. Inc. v. Calgene, Inc.* 188 F.3d 1362, 1369 (Fed. Cir. 1999).

B. REJECTIONS UNDER 35 U.S.C. §§ 101 AND 112, FIRST PARAGRAPH

Appellants appeal the rejections under 35 U.S.C. §§ 101 and 112, first paragraph, considered together by the Board, and request that these rejections be reversed.

Claim construction is a first step in any invalidity or infringement analysis. *Smiths Indus. Medical Sys., Inc. v. Vital Signs, Inc.*, 183 F.3d 1347, 1353 (Fed. Cir. 1999); *CAE Screenplates, Inc. v. Heinrich Fiedler GmbH & Co. KG*, 224 F.3d 1308, 1316 (Fed. Cir. 2000). The claims must be properly construed before considering the utility and enablement requirements of 35 U.S.C. §§ 101 and 112. *Process Control Corp. v. Hydreclaim Corp.* 190 F.3d 1350, 52 U.S.P.Q.2d 1029 (Fed. Cir. 1999).

To interpret claims, courts look first to the intrinsic evidence of record, i.e., the patent itself, including the claims, the specification and the prosecution history. "Such

intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996).

It is improper to read limitations from the specification into the claims. *Loctite Corp v. Ultraseal, Ltd*, 781 F.2d 861, 867, 228 U.S.P.Q. 90, 93 (Fed. Cir. 198). *Texas Digital Systems, Inc. v. Telegenix, Inc.* 308 F.3d 1193, 1204-05, 64 U.S.P.Q.2d 1812 (Fed. Cir. 2002). *Tate Access Floor, Inc. v. Interface Architectural Resources, Inc.* 279 F. 3d 1357, 1371, 61 U.S.P.Q.2d 1647 (Fed. Cir. 2002). The "interpretative process may not import limitations from the specification into the defining language of the claims." *Legget & Platt, Inc. v. Hickory Springs Manufacturing Co.*, 285 F.3d 1353, 1357, 62 U.S.P.Q.2d 1266 (Fed. Cir. 2002).

The utility requirement is found in 35 U.S.C. § 101: "Whoever invents any new and useful process . . . may obtain a patent therefor." The "use" requirement of section 112 "incorporates as a matter of law the requirement of 35 U.S.C. § 101 that the specification disclose as a matter of fact *a practical utility* for the invention." *In re Ziegler*, 26 U.S.P.Q.2d 1600, 1603 (Fed. Cir. 1993), citing *Cross v Iizuka,*753 F2d 1040, 1042-44, 224 U.S.P.Q. 739, 741-42 (Fed. Cir. 1985).

"Obviously, if a claimed invention does not have utility, the specification cannot enable one to use it." *In re Brana* 34 U.S.P.Q.2d 1436, 1439 (Fed. Cir. 1995). The absence of utility therefore can provide the basis for a rejection under both 35 U.S.C. § 101 and § 112. *In re Jolles* 628 F.2d 1322, 1326 n. 11, 206 U.S.P.Q. 885, 889 n. 11 (CCPA 1980).

An applicant is not required to correctly set forth, "or even know how or why the invention works." *Newman v. Quigg*, 877 F.2d 1575, 1581, 11 U.S.P.Q.2d 1340, 1345 (Fed. Cir. 1989). See, also, *Fromson v. Advance Offset Plate, Inc.* 720 F.2d 1565, 1570, 219 U.S.P.Q. 1137, 1140 (Fed. Cir. 1993). Hence, statements of how or why an invention operates also do not need to be recited in the claims.

> A specification disclosure which contains teaching of the manner and process of making and using the invention in terms which correspond in scope to those used in describing and defining the subject matter sought to be patented *must* be taken as in compliance with the enabling requirement of the first paragraph of § 112 *unless* there is reason to doubt the objective truth of the statements contained therein which must be relied on for enabling support (emphasis added).

In re Marzocchi 439 F.2d 220, 223, 169 U.S.P.Q. 367, 369 (CCPA 1971). The Patent Office has the burden of challenging a presumptively correct assertion of utility in the disclosure. *Id* "The threshold of utility is not high: An invention is useful under Section 101 if it is capable of providing some identifiable benefit."*Brenner v. Manson*, 383 U.S. 519, 534 (1966). "To violate § 101 the claimed device must be totally incapable of achieving a useful result." *Brooktree Corp. v. Advanced Micro Devices, Inc.* 977 F.2d 1555, 1571 (Fed. Cir. 1992). "Under the United States economic and patent systems 'valuation of the worth of an inventor's contribution is left to the public, not the judiciary in determining patentability.'" *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1573, 1 U.S.P.Q. 2d 1593, 1601 (Fed. Cir. 1987).

"Only after the Patent Office provides evidence

showing that one of ordinary skill in the art would reasonably doubt the asserted utility does the burden shift tothe applicant to provide rebuttal evidence sufficient to convince such a person of the invention's asserted utility." *In re Brana* 34 U.S.P.Q.2d 1436, 1441 (Fed. Cir. 1995). The inventors submitted declaration and supporting evidence pursuant to 37 C.F.R. § 1.132 during prosecution to rebut the Examiner's rejections, and this evidence was discussed in the inventors appeal brief to the Board pursuant to 37 C.F.R. 1.192(a). This evidence must be addressed on appeal to the Federal Circuit. *In re Wright*, 27 U.S.P.Q.2d 1510, 1514 (Fed. Cir. 1993).

1. The Board's Decision Erroneously Requires the Inventors' Claimed Invention to Produce Excess Heat Energy as a Result of a Nuclear Event, but the Claims on Appeal as Properly Construed do not Require these Features.

The claims considered by the Board in *Ex parte Dash*, 27 U.S.P.Q.2d 1481 (Bd. Pat. App. & Int., 1993) literally required production of ^{3}H. Independent claims 6, 10 and 11 (A948-A947) do not refer to "excess energy", nor do these independent claims literally recite any feature concerning a "nuclear event." The Board stated, incorrectly, that:As we have pointed out above, appellants have set forth in the written description in the specification and have alleged through out the prosecution of these applications that the production of heat energy involving an "unknown nuclear reaction" is the claimed invention, and thus we find *no basis in the record for either of these now asserted utilities*.Board's Opinion, A1-A17, A14, lines 5-9 (emphasis added). To the contrary, the claims as *initially filed* in the '967 application (added by Preliminary Amendment (A38-

A114) on January 29, 1993), specifically exclude recitations of how or why an invention works, e.g., by a "nuclear event." Claims 4-11 therefore should not be construed to require "excess energy" by a "nuclear event," or be construed to require the production of "^{3}H". To construe the claim language otherwise improperly imports limitations from the specification into the claims. Hence, the determination of whether the claimed invention has a practical utility is not constrained by the claim language to involve "excess heat energy" as a result of a nuclear reaction. While conceding that the literal claim language did not require the relevant features, the Board nevertheless reasoned that "the underlying written description in the common specification remains the same." Board's Opinion, A9, line 10. "Thus, we cannot agree with appellant's position that "[n]othing in the claims requires that a nuclear event occurs, nor do the claims require that the method produce 'excess heat.'" *Id.,* lines 20-21. This statement clearly establishes that features from the specification concerning how an invention works, e.g., "by a nuclear event," were improperly imported into the claims from the specification. The Board's opinion should be reversed for this reason alone.Moreover, the Board's conclusion factually misrepresents statements made in the specification. The inventors' specification sets forth a *possible* explanation for the production of heat energy, stating that "[I]t is *postulated that* these react in an unknown nuclear reaction in the cathode to yield tritium and energy." Patent Application, A25, lines 19-21. The inventors also argued in their brief to the Board in the alternative, i.e., that the claims should not be construed to require that a nuclear event occur, but if they were so construed, scanning electron micrographs and atomic force microscopy (AFM) examinations of the palladium cathode were provided during prosecution directed to this issue. The

Board apparently construed this to be an admission by the inventors that the claims be construed as asserted by the Examiner, and adopted by the Board, to require such features. This clearly is incorrect.

The Board's opinion is based on an erroneous claim construction, and should be reversed for this reason alone. Moreover, proper claim construction leads to the conclusion that evidence of a nuclear event and excess heat energy produced thereby need not be submitted to support operability, utility or enablement of the claimed invention.

2. A Specification Need Only Describe a Practical Utility, but May Describe More than One Practical Utility, and the Inventors' Claimed Invention has Utility Separate from Heat Production

The inventors' appeal brief (A347-A410) to the Board included a concise explanation of the invention defined by the appealed claims. Appeal Brief, A354-A357. The concise explanation reviewed all claim features and provided citations to page and line numbers where each claim feature was disclosed. The claim language itself provides sufficient disclosure to enable a person of ordinary skill in the art to assemble the apparatus, and to operate the assembled apparatus to practice the recited method.

The Patent Office and the Board assert that the invention does not have utility, and hence is not enabled, if the disclosed device operated to practice the claimed method, did not result in the production of *excess* heat energy as a result of a *nuclear* event. While this conclusion is first based on an erroneous claim construction, it also is incorrect for the following additional reasons.The Utility Guidelines state:

> An applicant must provide *only one credible assertion of specific utility* for any claimed invention to satisfy

> the utility requirement (emphasis added). Utility Guidelines at 147.

PTO Examination Guidelines on Utility Requirement, 1177 Official Gazette 146, 147, 50 Pat. Trademark & Copyright J. (BNA) 295, at 303 (1995). S*ee also Legal Analysis Supporting Utility Examination Guidelines,* 50 Pat. Trademark & Copyright J. (BNA) 297, 303and the cases cited at page 298, note 11. The enablement requirement of 35 U.S.C. § 112, first paragraph, is satisfied if the application discloses "*a practical utility* for the invention." *In re Ziegler*, 26 U.S.P.Q.2d 1600, 1603 (Fed. Cir. 1993), citing *Cross v. Iizuka,* 753 F2d 1040, 1042-44, 224 U.S.P.Q. 739, 741-42 (Fed. Cir. 1985).

While empirical data submitted by the inventors during prosecution, as discussed in detail below, establishes that electricity is converted to heat energy to at least some degree in the inventors' electrochemical cell, the present application as filed discloses at least one practical utility for the claimed invention in addition to the production of heat energy. The use requirement of 35 U.S.C. §§ 101 and 112 therefore is satisfied, and the utility rejection and enablement rejection should be reversed.

The Board stated that:

> As we have pointed out above, appellants have set forth in the written description in the specification and have alleged through out the prosecution of these applications that the production of heat energy involving an unknown nuclear reaction" is the claimed invention, and thus we find no basis in the record for either of these now asserted utilities. A14, lines 5-9.

This is incorrect. Appellants have consistently asserted during prosecution of this application and progenitor applications that they were under no obligation to explain how or why an invention works, and further that the claimed invention did not require "excess energy" by a nuclear event, such as the production of ^{3}H. The claims as filed in the '967 application, the progenitor application to the '712 application currently on appeal, were drafted to specifically exclude the term "excess," and to eliminate the extraneous, legally unnecessary recitation of how the invention works, e.g., by "a nuclear event." Second, the specification itself, and hence "the record," adequately sets forth these alternative utilities. For example, the invention as claimed results in the useful production of hydrogen and oxygen gases with less energy input because the control cell requires more energy than the experimental cell to produce the same amount of gas. The application states that:The gases may *also be collected for industrial uses*, in which case, the catalyst is not needed (emphasis added). Patent application, A26, lines 4-6.

Furthermore, the specification discloses that the claimed process can be used to produce heavy water. The invention further contemplates performing the process of the invention in an environment wherein gases produced by the electrolysis recombine under the action of a catalyst in a region disposed above the region where the electrolyte is contained. With hydrogen and deuterium formed at the cathode and oxygen formed at the anode, these *recombine* in the presence of a platinum-black catalyst to form water and *heavy water*. Patent application, A15, line 22 through A16, line 3 *(*emphasis added). The use of a catalyst to recombine hydrogen and oxygen is positively recited in claims 5 and 11. Thus, the present application provides sufficient detail to allow a person of ordinary skill in the art to assemble a device, and to practice the claimed method using that device,

to accomplish various useful endeavors, including the production of oxygen, hydrogen and deuterium gases, and the production of heavy water.

3. The Patent Office Failed to Produce Substantial Evidence Refuting the Inventors' Statements Concerning Utility and Enablement Sufficient to Shift the Burden to the Inventors' to Produce Rebuttal Evidence3. The Patent Office Failed to Produce Substantial Evidence Refuting the Inventors' Statements Concerning Utility and Enablement Sufficient to Shift the Burden to the Inventors' to Produce Rebuttal Evidence

With respect to the utility requirement, "[o]nly after the PTO provides evidence showing that one of ordinary skill in the art would reasonably doubt the asserted utility does the burden shift to the applicant to provide rebuttal evidence sufficient to convince such a person of the invention's asserted utility." *In re Marzocchi*, 439 F.2d 220, 223, quoted by *In re Brana*, 51 F.3d, 1560, 34 U.S.P.Q.2d 1436, 1491.

The Patent Office did not provide substantial evidence sufficient to shift the burden to Professor Dash to produce rebuttal evidence.

A. Reputed Evidence Relied on by the Patent Office was not directed to the Claimed Invention

The Examiner's Answer (A434-A479), and the Board's Opinion (A1-A17), refers to the work of others without ever first establishing that the work discussed had the features recited by the inventors' method claims. The work of others, directed to inventions having features other than that currently claimed by the inventors, is irrelevant to the operability of the inventors' claimed invention. The Board has characterized certain of the cited documents as "highly analogous" to the invention as claimed in the present application. *Ex parte Dash*, 27 U.S.P.Q. 2d 1481, 1481 (BPAI, 1993). How analogous must disclosed technology be before it is relevant to determining the patentability of the claimed

invention under 35 U.S.C. §§ 101 and 112, first paragraph? Regardless of the answer to this question, "highly analogous" art is most likely to be "highly irrelevant" to determining whether an invention different than that disclosed and claimed in the present application, in a heretofore unpredictable art, is operable.

B. References Cited by the Examiner Generally Are Irrelevant and/or Do Not Support the Position Asserted.

The Examiner, and the Board in affirming the rejection, relied heavily on documents, such as newspaper articles and books or articles from the general scientific press, that should be accorded little evidentiary weight. "[T]hese articles do not have anywhere near the same degree of evidentiary value as articles subjected to peer review and published in scientific journals by experts in the field." *Ex parte Dash*, 27 U.S.P.Q. 2d 1481, 1482 (BPAI, 1993).

Moreover, many of the publications relied upon by the Patent Office do not support the position asserted. For example, Huizenga states:

> [o]ver a hundred groups reported excess heat and/or some fragmentary evidence for trace amounts of fusion products. On the basis of the sheer number of positive claims, it is tempting to conclude, as many believers have, that there must be some truth to cold fusion.

Cold Fusion: The Scientific Fiasco of the Century, Oxford Univ. Press, 1993, at xi. In the Epilogue to this book, Huizenga notes that "claims of successful cold fusion experiments have continued to appear in media stories, preprints, conference proceedings and peer-reviewed journals" since July 1, 1991, when

the first edition of Huizenga's book went to press. *Id.* at 237. Huizenga discusses a survey by Douglas Morrison listing 86 papers that supported the existence of cold fusion by the end of 1992. He went on to observe: "A number of the positive papers lacked features such as controls, calibrations, multiple neutron counters, etc." Id. at 239. Of course, while "a number" lacked such features, the remaining reports, and likely the majority of the papers supporting the existence of cold fusion, included these features.

Similarly, Morrison stated:

> The balance of the evidence is that excess heat cannot be generated in a useful manner. The positive results are generally said to give excess heat erratically and in bursts which are claimed to last for many hours. It is hard to prove or to disprove such claims and many neutral people feel that some interesting physics might come out of further careful peer-reviewed studies.

Sov. Phys. Usp. 34:1055 at 1058 (1991) (emphasis added). Although Morrison views the "balance" of the evidence as tilting toward his strongly held position, even he admits that "many neutral people" found the experimental evidence for cold fusion obtained as of 1991 sufficiently promising to warrant further investigation. Thus, even the sharpest critics acknowledge that cold fusion research continues to be conducted internationally by

numerous reputable scientists in careful experiments that are published in peer-reviewed journals. Many of these scientists have reported excess heat production, for example. Thus, the present invention involves subject matter that a significant segment of the scientific community considers credible.

The Board's opinion states that "appellants do not support their arguments with references they consider to have high evidentiary value." Board's Opinion, A11, lines 23-24. Again, this is simply a factual mischaracterization. Appellants cited numerous publications that supported their claims of production of heat energy. For example, A105-A109 is an article by Dr. Schwinger, Nobel Prize winner (1965) for theoretical physics. Dr. Schwinger provides a theoretical basis for the production of heat energy when deuterium, as required by appellants' claimed system, produces ^{3}He in an H-D interaction and releases energy. An article by Dr. Takahashi of Osaka, Japan, also was provided, and describes his positive results. A113. Appellants also cited Miles *et al., Calorimetric Principles and Problems in Measurements of Excess Power during Pd-D_2O Electrolysis,"* J. Phys. Chem., 98, 1948-1952 (1994). The Journal of Physical Chemistry is an elite periodical that publishes peer-reviewed articles. Miles *et al.* specifically refute the conclusions of many of the investigators relied upon by the Patent Office to supposedly shift the burden to the inventors to produce rebuttal evidence.

C. The Inventors are not Required to Disprove the Critics of Cold Fusion Research or to Defend Cold Fusion Theory

During prosecution, Examiner Behrend stated that:

The invention (see for example pages 1+ of the specification) is considered as being based on the "cold fusion" concept set forth by Fleischmann and Pons (hereinafter, F and P) (see the 3/24/89 article by D. Braaten). The concept relies on the incorporation of deuterium into a metal lattice. A118, lines 15-19.[The cited references] provide irrefutable evidence of the inoperability of a "cold fusion" system of the type set forth by F and P [as well as applicants' system], and applicant has not shown this evidence to be in error. Office action, A126, lines 22-25. Contrary to the Examiner's suggestion, it is not the inventors' burden toverify the results of Fleischmann and Pons. The inventors note that "the failure of other devices designed for the same general purpose does not prove that appellants' device could not operate successfully." *In re Chilowski*, 229 F.2d 457, 463, 108 U.S.P.Q. 321, 326 (C.C.P.A. 1956).

Moreover, there are significant differences between the inventors' claimed invention and the system disclosed by Fleischmann and Pons. For example, method claim 10 recites using a composition comprising D_2O and sulfuric acid with a palladium cathode. This combination of features is not disclosed by Fleischmann and Pons.

Neither does the law require the inventors to defend a scientific concept or theory. An applicant "is not legally required to comprehend the scientific principles on which the practical effectiveness of his invention rests." *In re Anfhauser*, 399 F.2d 275, 283, 158 U.S.P.Q. 351, 357 (C.C.P.A. 1968). Even if, for the sake of argument, the production of heat energy by the claimed method does not result from, or cannot currently be explained by, fusion events, the invention would not be rendered unpatentable. It is enough if the present invention results in heat production,

by whatever means.

Particular References Identified and Considered by the *Board*

The Board's Opinion identified and considered particular references. A4-A5. Brief comments are provided in Appendix C concerning why these references do not provide substantial evidence sufficient to shift the burden to the inventors to produce rebuttal evidence.

REASONS FOR GRANTING THE PETITION

The United States Court of Appeals for the Federal Circuit (CAFC) has affirmed the decision of the United States Patent and Trademark Office Board of Patent Appeals and Interferences (Board) to reject application Serial No. 08/439,712 for lack of utility under 35 U.S.C. § 101 and lack of enablement under 35 U.S.C. § 112.

The Board's decision was based, at least in part, on an incorrect claim construction. This alone is sufficient to require that the Board's Opinion be reversed. The inventors also have provided an enabling, written description of several utilities for the claimed invention other than heat production. This too is, in and of itself, sufficient to require that the Board's Opinion be reversed. Moreover, even if The Court of Appeals for the Federal Circuit disagrees with these bases for reversal, the inventors have presented substantial evidence clearly establishing that the invention reproducibly results in the production of heat energy.

Evidence is presented that a U.S. Navy scientist at least

partially reproduced the claims of the inventors in his first experiment, even though he substituted an inferior material for one of the main components of the experiment. He also found that the inventors' electrolyte has very high conductivity, which means that it produces hydrogen with less power, which is a very desirable property as the world moves toward an economy based on hydrogen. He also detected ionizing radiation emanating from a cell during electrolysis. Such radiation is not expected from any known chemical reaction. Even though his experiment was flawed, he had indications of excess heat for the first several days of the experiment.

Other evidence is presented that the USPTO discriminated against scientists who suggested that their results are related to the ***cold fusion*** phenomenon. Because of this suggestion the results presented were deemed not to be credible, and a patent was not awarded. However, another scientist who obtained similar results without any suggestion to explain the origin of the results, was awarded a total of 12 U.S. patents. Clearly, the USPTO has ***hindered*** rather than ***promoted*** the progress of science, as suggested by the spirit of the US Constitution.

Groups of high school students in the U.S. and in Italy and university students in China have used our experimental protocol, and all were able to demonstrate anomalous heat. Clearly, our system has utility and is enabled. The USPTO did not comply with Title 35 of the U.S. Code.

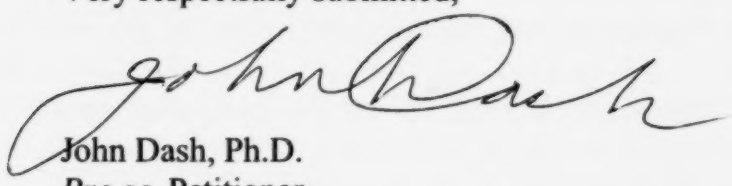
With the benefit of a patent it may be possible to obtain the funds needed to prepare an affordable kit to perform cold fusion experiments safely and reproducibly, so that teachers, students, and others all over the world may be able to explore this complex phenomenon, which is still very poorly understood. Then, advances in understanding may make it possible to increase the

scale to a practical size which could produce a product such as low cost hydrogen, a fuel which produces water when burned. This is much more desirable than carbon dioxide, a greenhouse gas produced by the combustion of fossil fuels.

The DoE recently concluded a review in which 18 scientists evaluated the cold fusion research performed world-wide during the past 15 years. Almost all of these scientists concluded that some aspects of cold fusion research should receive Federal support (Appendix K). Clearly, cold fusion does not belong in the same category as perpetual motion. Now that the stigma is lifting, scientists should be able to perform their research on cold fusion and be evaluated fairly by mainstream journals and by the USPTO.

For the reasons above, the Petitioner respectfully requests that this Petition for Writ of Certiorari be granted.

Very respectfully submitted,



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APPENDIX A

NOTE: Pursuant to Fed. Cir. R. 476, this disposition is not citable as precedent. It is a public record.

United States Court of Appeals for the Federal Circuit

04-1145
(Serial No. 08/439,712)

IN RE JOHN DASH and PATRICK S. KEEFE

DECIDED: December 10, 2004

Before MAYER, Chief Judge, PLACER, Senior Circuit Judge, and PROST, Circuit Judge.

PROST, Circuit Judge.

Professor John Dash and Patrick Keefe ("Dash") appeal from a United States Patent and Trademark Office Board of

Patent Appeals and Interferences ("Board") decision affirming the final rejection of claims 4-11 of application Serial No. 08/439,712 for lack of utility under 35 U.S.C. § 101 and lack of enablement under 35 U.S.C. §112. The examiner rejected the application for lack of utility and enablement. We affirm the Board's decision.

BACKGROUND

Dash's patent application discloses a method for generating heat energy using an electrolytic cell having a palladium sheet cathode and an inert anode. The electrolyte used in the cell principally contains sulfuric acid and D_2O, or "heavy water." According to Dash's specification, the method produces heat energy; hydrogen, deuterium, and oxygen gases; and possibly heavy water through the recombination of deuterium and oxygen.

Dash filed his initial patent application on this invention on April 16, 1990. The application was rejected by the examiner for lack of utility and enablement, and the Board affirmed the rejection. Ex parte Dash, 27 USPQ2d 1481 (Bd. Pat. App. & Int. 1993). Dash filed a continuation application that was also finally rejected on the same grounds. Dash responded by filing a file wrapper continuation application. After final rejection for lack of both utility and enablement and unsuccessful appeal to the Board, that application is now before us on appeal.

Dash and his graduate students have published experimental results that, they claim, suggest that nuclear fusion occurred in the apparatus described in the patent application. Specifically, they claim to have found distortion of the palladium cathode, possibly due to the formation of hydrogen isotopes on its surface; microscopic evidence of localized melting; and localized concentrations of gold and silver, which could have

been produced by nuclear reactions in the palladium. Additionally, they reported measurements of heat produced by the apparatus. Some of these results were submitted to the Patent Office in support of Dash's attempts to overcome the utility and enablement rejections.

DISCUSSION

Dash appeals the Board's decision sustaining the examiner's rejection on enablement and utility grounds. We have jurisdiction under 35 U.S.C. § 141 and 28 U.S.C. § 1295(a)(4)(A).

A. Standard of review

We review the Board's legal conclusions de novo and the underlying factual findings for substantial evidence. In re Gartside, 203 F.3d 1305, 1315 (Fed. Cir. 2000). The substantial evidence standard requires us to determine whether a reasonable fact finder could have arrived at the Board's decision. Id. at 1312. The Board's claim construction is reviewed de novo. See Cvbor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1456 (Fed. Cir. 1998). Whether an invention is operative, and hence has utility within the meaning of § 101, is a question of fact. In re Swartz, 232 F.3d 862, 863 (Fed. Cir. 2000). Enablement under § 112 is a question of law based on underlying factual inquiries. Enzo Biochem, Inc. v. Calgene, Inc., 188 F.3d 1362, 1369 (Fed. Cir. 1999).

B. Arguments

Dash argues that the examiner improperly required him to submit proof of the operability of his invention. He first asserts that the examiner misconstrued the claims at issue by considering the words "producing heat energy" in the preamble

of each claim to be a limitation and by importing a limitation from the specification by requiring the "heat energy" to be "excess energy" produced by cold fusion. Dash further argues that the examiner failed to establish a prima facie case of lack of utility, and therefore that the burden of proving utility should not have been shifted to Dash. Finally, he contends, if a prima facie case was established, then the evidence he submitted to the Patent Office was sufficient to rebut it.

The Patent Office responds that the specification clearly defines "heat energy" as excess energy and indisputably shows that the invention is directed to achieving cold fusion. The Patent Office also points out that Dash distinguished his invention from prior art on the basis of the preamble. Regarding utility, the Patent Office cites a considerable amount of scientific literature that casts doubt on the ability of electrolytic methods to produce cold fusion.

C. Analysis

As explained below, we construe the claims at issue to require the production of excess heat energy and to be directed to a method of achieving cold fusion. After that, we turn to the issues of utility and enablement, which here collapse into a single issue. See In re Brana, 51 F.3d 1550, 1564 (Fed. Cir. 1995) ("Obviously, if a claimed invention does not have utility, the specification cannot enable one to use it."). Given the scientific community's considerable doubt regarding the utility of "cold fusion" processes, we hold that the examiner established a prima facie case of lack of utility and enablement. Accordingly, the burden was shifted to Dash, and we hold that substantial evidence supports the Board's finding that Dash failed to meet that burden.

1. Claim Construction

The Board properly considered the preamble in its construction of the appealed claims. During prosecution, Dash distinguished a prior art reference on the basis that it "provide[d] no teachings concerning the electrolyte used by [the] present invention to produce excess thermal heat[,]" further asking: "What relevance does the degreasing of electrodes by [the prior art reference] have to the production of a thermal output according to the method steps of the present invention?" In response to another rejection based on prior art, Dash asserted that the prior art cells did not produce "unexpected superior heat," "excess thermal heat," or "excess heat[.]" Dash's use of the concept of "producing heat energy," a feature found only in the preamble of the appealed claims, to distinguish prior art supports construing the preamble as a limitation, or at least as "context" for the interpretation of the claims. See Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings, 370 F.3d 1354, 1362 (Fed. Cir. 2004) ("A preamble may provide context for claim construction, particularly, where as here, that preamble's statement of intended use forms the basis for distinguishing the prior art in the patents prosecution history."). Here, the preamble provides context for the utility determination by illustrating the purpose for which the invention must be operative. Thus, we believe that the Board did not act improperly by taking the preamble language into account.

Further, we agree with the Board's interpretation of the preamble. Viewing the language of the claims in light of the specification and prosecution history, one of ordinary skill in the art would understand the term "producing heat energy" to mean

that the invention generates a net output of heat energy. Dash repeatedly argued during prosecution that his invention produced "excess energy." Moreover, the specification postulate[s] that a nuclear reaction has taken place with the productionof energy." The specification offers no other explanation for the production of this energy, which it characterizes as "heat on a scale not reconciled with any known chemical reaction[.]" Additionally, Dash repeatedly submitted evidence during prosecution that purported to show that the invention produced excess heat caused by nuclear reactions. He also distinguished prior art on the basis that it did not produce the unexpected amounts of heat that Dash believed were produced by his invention. All these factors support the Board's conclusion that Dash's claims are directed toward methods of achieving cold fusion.

2. Prima Facie Case of Lack of Utility and Enablement,The Patent Office establishes a prima facie case of lack of utility by "showing that one of ordinary skill in the art would reasonably doubt the asserted utility[.]" Brana, 51 F.3d at 1566. Because the determination of whether an invention is operative is a question of fact, we review the Board's decision on this issue for substantial evidence. Dash argues that the evidence that supported the examiner's prima facie case is invalid because it does not concern the invention as claimed and because the documents cited are anecdotal or not peer-reviewed. However, we are aware of no rule that forbids the examiner from relying on related technology, anecdotal information, or sources that are not peer-reviewed to establish a case of inoperability. These details merely go to the weight of the evidence, not whether it can be relied upon at all. Thus, we understand Dash's arguments as attacks on the weight the Board

accorded to the cited information Substantial evidence supported the Board's finding that the examiner established a prima facie case of inoperability. While it may be ideal for the examiner to offer peer- reviewed data on precisely the claimed invention to establish such a case, such extreme certainty is not required. The examiner must only establish that a person of ordinary skill in the art would reasonably doubt the asserted utility. Brana, 51 F.3d at 1566. It was reasonable for the Board to conclude that the examiner had established such doubt based on the number and quality of cited references that debunked claims of cold fusion.

3. Dash's Rebuttal Evidence

Substantial evidence also supported the Board's conclusion that Dash failed to rebut the prima facie case of inoperability. Dash did not produce evidence sufficient to show that his invention generated excess heat. Although Dash compared his D_2O cell to an H_2O cell and measured a higher temperature in the D_2O cell, references cited by the examiner show that temperature differences between the two cells would be expected even without the production of excess heat because the differing properties of H_2O and D_2O, such as their different heats of absorption. Dash's other evidence, such as his claim of localized melting on the palladium electrode, at most establishes that some localized heating took place, not that the invention produced a net output of heat. Several studies cited by the examiner suggest that localized melting could have been the product of an electrochemical process that would not represent a net output of heat. Dash's evidence that his invention achieved cold fusion likewise does not convince us that he rebutted the examiner's prima facie case of inoperability. Dash

produced evidence regarding detection of tritium, transmutation of palladium, and physical transformation of the cathode, as well as corroborating experiments and calculations designed to show excess heat. For each type of evidence Dash produced, the examiner found at least one sound reason to disbelieve the evidence in either the literature that supported the prima facie case or in Dash's evidence itself. The Board affirmed the examiner's findings. The evidence cited by the examiner constitutes substantial evidence in support of the Board's decision. Accordingly, we hold that the Board acted reasonably in concluding that Dash did not make a showing sufficient to rebut the prima facie case of inoperability established by the examiner,

CONCLUSION. For the reasons stated above, we affirm the Board's decision sustaining the examiners rejection of claims 4-11 of application Serial No. 08/439,712.

APPENDIX B

The opinion in support of the decision being entered today was ***not*** written for publication and is ***not*** binding precedent of the Board.

Paper No. 45

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte JOHN DASH
and PATRICK S. KEEFE

Appeal No. 1998-1918
Application 08/439,712[2]

ON BRIEF

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[2] Application for patent, filed May 12, 1995. According to appellants, this application is a continuation of application 07/996,967 ('967 parent application), filed December 23, 1992, now abandoned, which is a continuation of application 07/509,585 ('585 grandparent application), filed April 16, 1990, now abandoned.

Before METZ, WARREN and DELMENDO,
Administrative Patent Judges.
WARREN, *Administrative Patent Judge.*

Decision on Appeal

This is an appeal under 35 U.S.C. § 134 from the decision of the examiner finally rejecting claims 4 through 11, which are all of the claims in the application. Claim 10 is illustrative of the claims on appeal:

10. A method of producing heat energy, comprising the steps of:

providing a container for receiving an electrolyte composition, a cathode and an anode;

forming an electrolyte composition comprising D2O and sulfuric acid;

placing a sufficient amount of the electrolyte composition in a container to at least partially cover a palladium sheet cathode and an inert anode situated inside the container;

connecting said cathode and anode to a source of electricity; and applying a voltage of about 3.5 volts across the cathode and anode.

The appealed claims, as represented by claim 10, are drawn to a method of producing heat energy using an electrolyte composition that contains sulfuric acid and D_2O, that is, deuterium oxide which is also known as "heavy water," to at least partially cover a palladium sheet cathode and an inert anode in a container and applying a voltage of about 3.5 volts across the cathode and anode. Certain claims specify that a space is provided above the electrolyte for recombination of gases produced by electrolysis, and said space can contain a

catalyst for this purpose. Appellants disclose that they have observed that this method provides "significant amounts of energy in the form of heat," and postulate that this is because of an"unknown nuclear reaction in the cathode" (specification, page 1).

The Record

The first brief filed by appellant Dash, *pro se*, on may 15, 1996 (Paper No. 27), was found to be non-complaint with 37 CFR § 1.192(c) by the examiner in the communication mailed September 5, 1996 (Paper No. 28), in part because of the reference in the brief to declarations and other materials that were denied entry by the examiner (page 4). Appellant Dash, *pro se*, filed a supplemental brief on May 15, 1997 (Paper No. 30), and the examiner mailed an answer thereto on January 22, 1998 (Paper No. 35). The declarations listed in appendix B of the supplemental brief have been discussed by the examiner in the answer. We cannot find where the document Melvin H. Miles et al., "Calorimetric Principles and Problems in Measurements of Excess Power during Pd-D_2O Electrolysis," *Journal of Physical Chemistry*, February 17. 1994, p. 1948-52, also cited in appendix B of the supplemental brief, has been entered in the record and considered by the examiner. Similarly, appellants refer in the brief to a "statistical analysis of the data already of record as submitted to the Patent Office in response to the final Office action of September 5, 1995" (pages 38-40), which "data" was not entered into the record because the examiner refused entry of appellants' response to the final Office action in the advisory action of February 22, 1996 (Paper No. 25; see also Paper No. 28). The reply brief filed by appellants, through counsel, on May 4, 1998 (Paper No; 37) was denied entry by the examiner in the communication

mailed August 21, 2000 (Paper No. 40).

In the remand entered September 23, 2002 (Paper 41
No. 42), a prior panel of this Board reviewed the record, and with respect thereto, provided appellants with, *inter alia*, an opportunity to establish a date that one skilled in this art could have practiced the claimed invention based on the teachings of the specification before or after the filing date of the '585 grandparent application, and in that respect, to submit evidence establishing such a date between the filling date of the '585 grandparent application and the present application (see above note 1), citing *Reffin v. Microsoft Corp.*, 214 F.3d 1342, 1346, 54 USPQ2d 1915, 1917-18 (Fed. Cir. 2000), quoting *In re Glass*, 492 F.2d 1228, 1232, 181 USPQ 31, 34 (CCPA 1974) (Paper No. 42, page 2). Appellants, through counsel, declined, as confirmed by the communication faxed to counsel by Mr. M. C. Cashion, Jr., Program and Resource Administrator, on June 16, 2003 (Paper No. 44).

Accordingly, we consider the grounds of rejection advanced on appeal with respect to the positions of the appellants in the supplemental brief (Paper No. 30), and of the examiner in the answer (Paper No. 35), and refer to these two documents for a complete exposition of the opposing positions.

*The References:*In the '585 grandparent application a prior panel of this Board entered a decision onNovember 24, 1992 in the '585 grandparent application (Paper No. 11), reported as *Ex parte Dash*,27 USPQ2d 1481 (Bd. Pat, App. & Int. 1992). In that appeal, the prior panel considered twenty two of the references cited by the examiner in the present appeal (answer, pages 2-5) in affirming grounds of rejection under 35 U.S.C. §§ 101 and

112, first paragraph, enablement requirement ('585 grandparent application, Paper No. 11, pages 2-4; 27 USPQ2dat 1481-82).

While we have considered the references relied on by the examiner in this appeal, we list here the references that were not before the prior panel in the prior appeal, and references we specifically refer to below with respect to grounds of rejection under §§ 101 and 112, first paragraph, enablement requirement, in the present appeal.

Alessandrello et al., "Search for Cold Fusion Induced by Electrolysis in Palladium," 103 *Il Nuovo Cimento*, n. 11, 1617-39 (1990).

Astakhov et al., "An Attempt To Detect Neutron and Gamma Radiations In Heavy Water Electrolysis With A Palladium Cathode," 36 *Electrochimica Acta*, no. 7, 1127-28 (1991).

Bosch et al., "Electrochemical Cold Fusion Trials at IPP Garching," 9 *Journal of Fusion Energy*, no.2, 165-86 (1990).

Broad, "Cold-Fusion Claim is Faulted On Ethics as Well as Science," *The New York Times*, March 17, 1991, 1 and 30.

Close, *Too Hot To Handle: The Story of the Race for Cold Fusion*, 146-71, 200-15, 289-349, 351-53 (London, W. H. Allen Publishing. 1990).

Dagani, "Latest Cold Fusion Results Fail To Win Over Skeptics," *Chemical & Engineering News* 38-41 (June 14, 1993)

.Ewing et al., "A Sensitive Multi-Detector Neutron Counter Used to Monitor 'Cold Fusion' Experiments in an Underground Laboratory; Negative Results and Positive Artifacts," 37 *IEEE*

Transactions on Nuclear Science, no. 3, 1165-70 (June 1990).

Hadfield, "Lukewarm reception for Japanese cold fusion," *New Scientist* 10 (October 31, 1992).

Huizenga (Huizenga (II)), "Cold Fusion," 70 *Chemical & Engineering News* 38-41 (July 20, 1992).

Huizenga(Huizenga (IV)), "Cold Fusion Labeled 'Fiasco of Century,'" 7 *Forum For Applied Research and Public Policy*, no.4, 78-83 (The University of Tennessee Energy, Environment, and Resources Center and Oak Ridge National Laboratory. 1992).

Huizenga (Huizenga (I)), *Cold Fusion: The Scientific Fiasco of the Century*, 22-43, 58-287 and 292-318 (New York, Oxford University Press, 1993).

Huizenga (Huizenga (III)), *New Developments In The Cold Fusion Saga*, 207 *Abstracts Of Papers Of The American Chemical Society* p6-NUCL (March 13, 1994).

Jones, "Current issues in cold fusion research: heat, helium, tritium, and energetic particles," 51 *Surface and Coatings Technology* 283-89 (1992).

Kreysa et al., "A critical analysis of electrochemical nuclear fusion experiments," 226 *J. Electroanal Chem.*, 437-450 (1989).

Myers et al., "Search for Cold Fusion at D/Pd >1 Using Ion Implantation," 9 *Journal of Fusion Energy*, no. 3, 263-68 (1990).

Rolison et al., "Observation of Elemental Anomalies at the Surface of Palladium after Electrochemical Loading of Deuterium or Hydrogen," Analytical Chemistry 1697-1702 (1991).

Rousseau, "Case Studies in Pathological Science," 80 *American Scientist* 54-63 (1992).

Silvera et al., "Deuterated palladium at temperatures from 4.3 to 400 K and pressures to 105 kbar: Search for cold fusion," 42 *Physical Review B*, no. 14, 9143-46 (November 15, 1990).

Taubes, "Cold Fusion Conundrum at Texas A&M," 248 Science 1299-1304 (1990).

Taubes, *BAD SCIENCE: The Short Life and Weird Times of Cold Fusion*, 303, 425-28, 475-81 (New York, Random House. 1993).

Taylor et al., "Search For Neutrons From Deuterated Palladium Subject To High Electrical Currents," *LA-CR 94-970*, 1-11 (Los Alamos National Laboratory, Los Alamos, New Mexico 87545. 1994).

Williams et al., "Upper bounds on 'cold fusion' in electrolytic cells," 342 *Nature* 375-84 (1989).

Wilson et al., "Analysis of experiments on the calorimetry of LiOD-D_2O electrochemical cells," 332 *J. Electroanal. Chem.*, nos, 1 and 2, 1-31 (1992).

WGBH-TV, Show #1802 Transcript, NOVA. Confusion in a Jar," pp. 2-19 (New York, NY, Journal Graphics, Inc., April 30, 1991).

The references relied on by the examiner with respect to the grounds of rejection based on prior art are:

Edison 1,016,874	Feb. 6, 1912
Spengler et al. (Spengter) 3,446,725	May 27, 1969
George et al. (George) 3,464,860	Sep. 2, 1969
von Sturm 4,146,446	Mar. 27, 1979
Jensen 4,447,508	May 8, 1984
Pons et al. (Pons) WO 90/10935 (published World Intell. Prop. Org. Application)	Sep. 20, 1990

Fedorova et al. (Fedorova), "The Formation and Stability of The β-Phase System of Palladium and hydrogen In Aqueous Solution," 34 *Russian Journal of Physical Chemistry*, no. 3. 325-26 (published translation by The Chemical Society, London. 1959).

Flanagan et al. (Flanagan), "Hydrogen Absorption By Palladium In Aqueous Solution," 55 Transactions of The Faraday Society, part 8, No. 440, 1400-08 (1959).

Fleisclimann et al. (Fleischmann), "Electrochemically induced nuclear fusion of deuterium," 261 *J. Electroanal Chem.* 301-08 (1989).

Krause et al. (Krause), "On Palladium-Hydrogen," LXVIII *Transactions of The Electrochemical Society* 449-70 (1935).

The Grounds of Rejection

The examiner has advanced the following grounds of rejection on appeal: claims 4 through 9 and 11 stand rejected

under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement (answer, pages 5-6);claims 4 through 11 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement (answer, pages 6-31);

claims 4 through 11 stand rejected under 35 U.S.C. § 101 because the invention as disclosed is inoperative and therefore lacks utility (answer, pages 31-38);

claims 4 through 11 stand rejected under 35 U.S.C. § 103 as being unpatentable over Fleischmann in view of any of von Strum, Spengler, Fedorova, Flanagan or Krause (pages 38-42);

claims 4 through 11 stand rejected under 35 U.S.C. § 103 as being unpatentable over Fleischmann in view of any of von Strum, Spengler, Fedorova, Flanagan or Krause, as applied to claims 4 through 11 above and further in view of any of George, Edison or Jensen (pages 42-43); and claims 4 through 11 stand rejected under 35 U.S.C. § 102(a, g) as anticipated by Pons (pages 43-44).

Appellants state in their brief (page 8) that the appealed claims should be considered separately (page 8), to which the examiner agrees (answer, page 2). Thus, we decide this appeal based on all of the appealed claims. 37 CFR § 1.192(c)(7) (1996).

We affirm the grounds of rejection under 35 U.S.C. §§ 101 and 112, first paragraph, enablement requirement, and reverse the grounds of rejection under 35 U.S.C. § 112, first paragraph, written description requirement and under 35 U.S.C. §§ 102(a, g) and 103.

Opinion: We consider first the grounds of rejections under 35 U.S.C. § 112, first paragraph, enablement requirement, and under 35 U.S.C. § 101 together because whether the written description of the specification provides an enabling disclosure under the former statutory provision, and whether an application satisfies the utility requirement of the latter statutory provision are closely related issues. *In re Swartz*, 232 F.3d 862, 863, 56 USPQ2d 1703, 1703-04 (Fed. Cir. 2000); *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1358, 52 USPQ2d 1029, 1034 (Fed. Cir. 1999).

To satisfy the enablement requirement of § 112, the written description of the specification must adequately disclose the claimed invention so as to enable a person skilled in the art to practice the full scope of the claimed invention at the time the application was filed without undue experimentation. *Enzo Biochem, Inc. v. Calgene, Inc.*, 188 F.3d 1362, 1371-72, 52 USPQ2d 1129, 1136 (Fed. Cir. 1999). The utility requirement of § 101 requires that any patentable invention be useful and thus, the subject matter thereof must operably provide useful results. *See Swartz*, 232 F.3d at 863, 56 USPQ2d at 1704; *Process Control Corp.*, 190 F.3d at 1358, 52 USPQ2d at 1034; *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1571, 24 USPQ2d 1401, 1412 (Fed. Cir. 1992).

Therefore, if the claims in an application fail to meet the utility requirement because the invention is inoperative, the claims also fail to meet the enablement requirement because a person skilled in the art cannot practice the invention. *See Process Control*, 190 F.3d at 1358, 52 USPQ2d at 1034-35; *see also In re Ziegler*, 992 F.2d 1197, 1200, 26 USPQ2d 1600, 1603 (Fed. Cir. 1993) ("The how to use prong of section 112 incorporates as a matter of law the requirement of 35

U.S.C. § 101 that the specification disclose as a matter of fact a practical utility for the invention."). Lack of utility because of inoperativeness is a question of fact, *In re Cortright*, 165 F.3d 1353, 1356, 49 USPQ2d 1464, 1465 (Fed. Cir. 1999), and the absence of enablement is a legal conclusion based on underlying factual inquiries. *Enzo*, 188 F.3d at 1369, 52 USPQ2d at 1134.

In order to establish a *prima facie* case that the claimed invention is not useful or is inoperative under § 101, the examiner has the burden of establishing with substantial evidence that one of ordinary skill in the art would reasonably doubt the objective truth of the statements of utility in the written description in the specification. See Swartz, 232 F.3d at 863, 56 USPQ2d at 1704; *In re Brana*, 51 F.3d 1560, 1566, 34 USPQ2d 1436, 1441 (Fed. Cir. 1995). In order to establish a *prima facie* case that the claimed invention is not enabled under § 112, first paragraph, the examiner has the burden of establishing with substantial evidence that one of ordinary skill in the art would reasonably doubt the objective truth of the statements of enablement of the full scope of the claimed invention set forth in the written description in the specification, including reasons why the description of the invention in the specification would not have enabled one of ordinary skill in this art to practice the full scope of the claimed invention without undue experimentation at the time the application was filed. *See generally*, *Swartz*, *supra*; *In re Wright*, 999 F.2d 1557, 1563, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993); *In re Wands*, 858 F.2d 731,

737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988); *In re Marzocchi*, 439 F.2d 220, 223-24, 169 USPQ 367, 369-70 (CCPA 1971).On the record of this appeal, with respect to the ground of rejection under § 101, we determine that the examiner has provided substantial evidence in the form of a considerable number of references establishing that, *prima facie*, over the period from the filing of the '585 grandparent application on April 16, 1990, to the filing of the present application on May 12, 1995, which includes, of course, the filing of the '967 parent application on December 23, 1992, the results in the area involved with methods of producing heat energy such as by electrolysis using a palladium cathode in an electrolyte intended to provide a nuclear reaction in the cathode, including so-called "cold fusion" reaction, were irreproducible such that one skilled in the art would reasonably doubt the utility and operability of such methods, including the claimed methods of producing heat energy encompassed by the appealed claims postulated by appellants to involve a nuclear reaction at the cathode in the written description of the specification common to all three applications. With respect to the ground of rejection under § 112, first paragraph, enablement requirement, we determine that the examiner has further established with this substantial evidence covering said time period that, *prima facie*, embodiments of the method of producing heat energy disclosed in the written description of the specification common to all three applications, were inoperative as the concept of the claimed method of producing heat energy and the disclosed embodiments could not have been practiced by one skilled in the art with the knowledge in the art at the time any of the applications were filed without undue

experimentation. *See Swartz*, 232 F.3d at 863, 56 USPQ2d at 1704.

Accordingly, the burden has shifted to appellants to submit evidence of operability sufficient to overcome the reasonable doubt thereof established by the examiner, and that there was sufficient knowledge in the art to have enabled one skilled in this art to have practiced the concept of the claimed invention as set forth in the written description in the common specification without undue experimentation at a date prior to at least the filing date of the application on appeal. Therefore, since a *prima facie* case has been established over the applied references by the examiner with respect to the grounds of rejection under §§ 101 and 112, first paragraph, enablement requirement, we have again evaluated the evidence in these respects based on the record as a whole as established in appellants' brief and the examiner's answer, giving due consideration to the weight of appellants' arguments and the evidence in the submitted declarations set forth in appendix B of the brief as relied on in the brief. *See Swartz*, *supra*.

The appealed claims are all drawn to a method of producing heat energy using an electrolyte composition that contains sulfuric acid and D_2O, deuterium oxide which is "heavy water," to at least partially cover a palladium sheet cathode and an inert anode in a container and applying a voltage of about 3.5 volts across the cathode and anode. While the appealed claims before us thus do not include the language "[a] method of producing energy through electro-chemical charging of a palladium cathode" which produces "the result... releasing at the cathode of ^2H and ^1H atoms which convert to ^3H with the production of energy" contained in the claims appealed in the '585 grandparent application

(Paper No. 11, page 2; 27 USPQ2d at 1481), the underlying written description in the common specification remains the same. Indeed, we determine that one of ordinary skill in this art would interpret the method as claimed here and in the '585 grandparent application as based on the same electrolysis conditions. *Compare* the present appealed claims with claims 1 through 5 appealed in the '585 grandparent application (specification, pages 7-8). *See In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997). As we noted above, appellants disclose that they have observed that the method described in the written description provides "significant amounts of energy in the form of heat" and postulate that this is because of "unknown nuclear reaction in the cathode" (specification, page 1), and we point out here, the "production of tritium in the electrolyte containing heavy water and sulfuric acid" (*id.*, page 5), which would require "a nuclear reaction."

Thus, we cannot agree with appellant's position that "[n]othing in the claims requires that
a nuclear event occurs, nor do the claims require that the method produce 'excess heat.'"
Appellants therefore traverse the rejection of any pending claim because the specificatioallegedly does not describe or enable excess heat energy by a nuclear event" (brief. page 10[3]).To the contrary, appellants submit that they "have presented evidence concerning thetransmutation of palladium electrodes used in the practicing the claimed invention," and that "the production of gold and silver is strong evidence that a nuclear event does occur" (supplemental brief, page 11).

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[3] We note here that the supplemental brief section "VIII. ARGUMENT, A.," pages 8-14, reads the same as the section "VIII, ARGUMENT, B.," pages 14-21.

Accordingly, we find that contrary to appellants' admonitions in the supplemental brief to focus on the claimed method (supplemental brief, e.g., pages 14 and 33), the examiner has done so in establishing a *prima facie* case under each of §§ 101 and 112, first paragraph, enablement requirement. Thus, we review appellants' supplemental brief and the examiner's answer to determine whether appellants have carried their burden of submitting evidence of operability sufficient to overcome the reasonable doubt thereof established by the examiner and of sufficient knowledge in the art that one skilled in this art could have practiced the concept of the claimed invention without undue experimentation at a date prior to at least the filing date of the application on appeal.

With respect to the references relied on by the examiner, appellants contend, with respectto § 112, first paragraph, enablement requirement, that the references on which the examinerrelies are not of sufficient evidentiary weight for the examiner's purposes, and with respect to the"number of articles indicating that 'cold fusion' systems are inoperative," that they "are under no obligation to explain either the positive or the negative results of others" with respect to systems which are not "identical to appellants' method and hence are irrelevant to appellants' claimed method" (supplemental brief pages 13-14, original emphasis deleted).

Appellants contend with respect to § 101,[4] that "the production of excess heat in an electrochemical cell has been reported by numerous reputable scientists on the basis of careful experiments published in peer-reviewed journals,"

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[3] We find that appellants' discussion of the applied references would also apply to references applied in the ground of rejection under § 112, first paragraph, enablement requirement.

shows that "the present invention involves subject matter that a significant segment of the scientific community considers credible," without citing such "peer-reviewed journals" (supplemental brief, page 32). In this respect, appellants further argue several points. First, the cited references "are largely irrelevant" with respect to utility and operability since the claimed invention is not described or tested (supplemental brief, page 33). Second, articles from the "general scientific press" cannot be relied on to establish a credible utility because in the prior appeal, the prior panel held that such references do not have "the same degree of evidentiary value as articles subject to peer review and published in scientific journals by experts in the field," citing *Dash*, 27 USPQ2d at 1482, noting that the examiner "has relied especially heavily upon non-peer-reviewed books, articles, and letters of the most strident critics of cold fusion research, particularly John Huizenga and Douglas Morrison. See,Dagani" (supplemental brief, pages 33-34). Third, in contending that the examiner's position is not supported by Huizenga (I) who reports "over a hundred groups reported excess heat and/or fragmentary evidence for trace amounts of fusion products," and noting the survey of Morrison discussed therein, appellants acknowledge that not all of the reported experiments were controlled and point to the statement of Morrison that "[i]t is hard to prove or to disprove such claims," but submit that despite these "sharpest critics," "cold fusion research continues to be conducted internationally" and "[t]hus, the present invention involves subject matter that a significant segmentof the scientific community considers credible" (supplemental brief, pages 34-35).

We cannot subscribe to appellants' position. We initially note that the statement with respect to the evidentiary value of a reference attributed to the prior panel of this Board with respect to references of the general scientific press, was made with respect to newspaper articles by Broad, one of which is of record on this appeal as cited above. It is elementary, as pointed out by the prior panel, that references have to be weighed with respect to their evidentiary value. In this respect, some references such as the newspaper article by Broad, may at best only serve as a measure of the pulse of the scientific community with respect to this topic. However, more substantial articles in the general scientific press which are not peer-reviewed, such as Huizenga(I), are entitled to greater evidentiary weight. Indeed, appellants rely, *inter alia*, on Huizenga (I) toshow that there are reported experimental studies that present results that may indicate the presence of the phenomenon. However, while this may be so, on this record, it is of insufficient weight to alone establish utility and enablement within the meaning of §§ 101 and 112, first paragraph, enablement requirement. Indeed, appellants do not support their arguments in these respects, with references that they consider to have a high evidentiary value, instead contending out that they are under no obligation to prove or disprove the reported results of others. However, in the absence of such argument and supporting evidence on this record, we cannot agree with appellants position that the applied references do not apply to the claimed invention and the concepts embodied therein as applied by the examiner. In this respect, we find it apparent from the references we have listed above that were not before the prior panel, as well as some, such as Bosch, that were, that the examiner has relied on a number of reference in peer-reviewed and other reputable journals. Certain of these references apply to the

components and operation of electrolytic cells with respect to whether nuclear reactions involving the palladium cathode occurred, and others clearly pertain to such endeavors. Therefore, in the absence of effective argument and objective evidence on this point by appellants, we find that the references assembled by the examiner as a whole constitute substantial evidence in support of the examiner's arguments that the appealed claims before us do not comply with the provisions of §§ 101 and 112, first paragraph, enablement requirement.Turning now to the evidence in the declarations under 37 CFR § 1.132 presented by appellant Dash as outlined in appendix B to the supplemental brief, we are mindful that each of the grounds of rejection would be overcome if appellants establish through this evidence that the claimed methods produce heat energy in a reliable, reproducible manner, that is, appellants' invention can be practiced in an operable manner without undue experimentation, which result would be effective as of the filing date of the '585 grandparent application. *See Brana*, 51 F.3d at1566, and n. 19, 34 USPQ2d at 1441-42, and n.19. We have reviewed the evidence in the declarations in light of the arguments of appellants (supplemental brief, pages 9-13, 37-38 and40-42, and Appendix B) and the examiner (answer, pages 10-14, 19-21, 27-28, and 34-35).

Appellants contend that the data in the graphs attached as exhibits to the declaration submitted January 25, 1993,[4] and the two declarations styled as "First" and "Second,"respectively, submitted July 25, 1994,[5] show that as conducted according to the protocols set forth in the

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[5] These two declarations were filed in the '967 parent application (Paper No. 13). A declaration styled "Third" was also presented therewith. This declaration is not cited in Appendix B and in it, appellant Dash reports the contents of a presentation by a "Dr. Francesco Celani" with respect to the localized deformation of palladium cathodes.

declaration of January 25, 1993, "the method claimed by the present application produced a higher thermal output than a control cell" (supplemental brief, pages 10-11); that the measurements used in obtaining the data are precise (supplemental brief, pages 11-12); that "the concentrations of [silver] and [gold] that are found on the cathode are greater than can be explained by diffusion within the cathode,"apparently with respect to the "First" declaration which contains evidence with respect to analysis of the surface of the palladium cathode (supplemental brief, page 12; see also pages 40-41; "First" declaration, ¶ 12 and associated exhibits); that the "First" declaration employs an "H-cell," which has water in the electrolyte, as a control cell that is otherwise identical to the "D-cell," which uses deuterium oxide in the electrolyte (supplemental brief, page 38); that the experiments as reported by appellants are reproducible as shown by appellants and third parties, such as Ms. Nicholas, in the "First"declaration (supplemental brief page 41). On this basis, appellants submit that their "evidence of excess heat production and the presence of gold and/or silver coincident with localized melting of the palladium cathode is unrebutted" by the examiner because they have used the"safeguards" cited by the examiner "in their experiments or have explained why they are unnecessary" (supplemental brief pages 41-42).

The examiner finds the evidence in these declarations unconvincing for a number of reasons, supported by citation of a number of references, all to the affect that appellants have not established by data supported by a reliable assay or system, that the claimed methods will in fact provide the asserted reproducible results. On this record, it seems to us that the examiner has provided substantial evidence that that one of ordinary skill in the art would reasonably doubt the objective evidence set forth in the declarations. Appellants

have not presented effective argument supported by evidence to rebut the examiner's findings that the evidence in the declarations is not convincing. In this respect, it is well settled that the burden of establishing the practical significance of data in the record for any asserted purpose, rests with appellants, which burden is not carried by mere arguments. *See generally In re Geisler*, 116 F.3d 1465, 1470,43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997); *In re Huang*, 100 F.3d 135, 140, 40 USPQ2d 1685,1689-90 (Fed. Cir. 1996); *In re Merck*, 800 F.2d 1091, 1099, 231 USPQ 375, 381 (Fed. Cir.1986); *In re Longi*, 759 F.2d 887, 897, 225 USPQ 645, 65 1-52 (Fed. Cir. 1985); *In re Borkowski*,505 F.2d 713, 718, 184 USPQ 29, 33 (CCPA 1974); *In re Lindner*, 457 F.2d 506, 508,173 USPQ 356, 358 (CCPA 1972).

Finally, we have considered appellants' arguments with respect to an alternative utility that it is "irrefutable that electricity is converted to heat energy at least to some degree" by the claimed method, recognizing that one issue in that respect is "the magnitude of the heat output,"and that the claimed method also produces hydrogen and oxygen gases as shown in the specification" (supplemental brief, pages 42-43). As we have pointed out above, appellants have set forth in the written description in the specification and have alleged through out the prosecution of these applications that the production of heat energy involving an "unknown nuclear reaction" is the claimed invention, and thus we find no basis in the record for either of these now asserted utilities. *See Swartz*, *supra*. Accordingly, based on our consideration of the record before us, we have weighed the evidence in the references applied by the examiner with appellants' countervailing arguments and evidence, and on this basis conclude that the claimed invention encompassed by appealed claims 4 through 11 lacks utility as a matter of

fact under 35 U.S.C. § 101, and lacks enablement as a matter of law under 35 U.S.C. § 112, first paragraph. enablement requirement. Therefore, we affirm these grounds of rejection.

Turning now to the ground of rejection of appealed claims 4 through 9 and 11 under 3U.S.C. § 112, first paragraph, written description requirement, it is well settled that the examiner has the burden of making out a *prima facie* case that the appealed claims do not comply with this section of the statute by setting forth evidence or reasons why, as a matter of fact, the written description in appellant's disclosure would not reasonably convey to persons skilled in this art that appellants were in possession of the invention defined by the claims, including all of the limitations thereof, at the time the application was filed. *See generally, In re Alton*, 76 F.3d1168, 1175-76, 37 USPQ2d 1578, 1583-84 (Fed. Cir. 1996), citing *In re Wertheim*, 541 F.2d257, 263-64, 191 USPQ 90, 97 (CCPA 1976). Here, the examiner contends only that the specification does not disclose the transitional phrase "consisting essentially of" (answer, pages5-6). Appellants point out that there is disclosure in the specification for using this term with its customary meaning in claim construction even though the phrase is not disclosed. Because the examiner has not again established a *prima facie* case that the appealed claims do not comply with this section of the statute by setting forth evidence or reasons in response to appellants arguments, we reverse this ground of rejection.

Finally, we consider the grounds of rejection of the appealed claims under 35 U.S.C.§§ 102 and 103 which are respectively based on Pons and on Fleischmann that are directed to"cold fusion." It must be established by objective facts that a reference or a combination of references relied upon to support a rejection under these statutory provisions must provide an enabling disclosure, i.e., the teachings of the

reference(s) must place the claimed invention in the possession of the public. *See generally*, *In re Spada*, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657(Fed. Cir.1990); *In re Payne*, 606 F.2d 303, 314, 203 USPQ 245, 255 (CCPA 1979). In other words, an invention is not placed in the possession of the public unless it is established by objective facts that there is some known or obvious way to make and use it. *Id.* The examiner's statement of each of these grounds of rejection does not comply with these requirements because the examiner's rejections rely principally on the work of and publication of Pons and of Fleischmann in the area of "cold fusion" which have been substantially discredited by the attempts of those skilled in the art to duplicate the results of their work as seen from references on which the examiner relies with respect to the grounds of rejection under 35 U.S.C. §§ 101 and 112, first paragraph, enablement requirement. Clearly, based on the record before us, the reference to Pons and the reference to Fleischmann cannot be relied upon either separately or in combination with other references to support the examiner's rejections because neither is an enabling prior art reference. Accordingly, we cannot sustain the examiner's rejections under 35 U.S.C. §§ 102 and 103.

Summary

In summary, we have affirmed the grounds of rejection of appealed claims 4 through 11, all of the claims on appeal, under 35 U.S.C. § 112, first paragraph, enablement requirement, and under 35 U.S.C. § 101.

We have reversed the ground of rejection of appealed claims 4 through 9 and 11 under 35 U.S.C. § 112, first paragraph, written description requirement, and of appealed claims 4 through11 under 35 U.S.C. § 103 and under 35 U.S.C. § 102(a, g). The examiner's decision is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

ANDREW H. METZ
Administrative Patent Judge

CHARLES F. WARREN
Administrative Patent Judge

ROMULO H. DELMENDO
Administrative Patent Judge

BOARD OF
PATENT
APPEALS
AND
INTERFERENCES

APPENDIX C

COMMENTS ON REFERENCES CITED BY THE BOARD

Alessandrello *et al.* describe experiments that were performed in an underground laboratory in order to suppress environmental neutrons. Kozima (Discovery of the Cold Fusion Phenomenon, Ohtake Shuppan Inc., Tokyo, 1998) has shown that environmental neutrons are necessary for fusion to occur.

Astakhov *et al.* did not use the same electrolyte as recited in the current claims. Astakhov *et al.* used either LiOD or D_2SO_4 in D_2O.

Bosch *et al.* performed experiments using LiD in D_2O, and not the electrolyte composition as recited in the claims on appeal.

Broad is a New York Times article, published on March 17, 1991, not a peer-reviewed publication, that does not adequately discuss positive results obtained. For example, the Scott group at ORNL reported tritium activity 25 times the background level in a burst lasting two to three hours. Broad did not mention this work performed at a prestigious national laboratory.

Dagani discusses a paper published by Fleischmann and Pons in Physics Letters A, a prestigious, peer-reviewed physics journal, in 1993. The report is quite balanced. The thermal power claimed in these cold fusion experiments is of the same magnitude as that produced by a nuclear fission breeder reactor, therefore much greater than could be produced by any known chemical reaction.

Ewing *et al.* describe research designed to detect neutrons

from a cold fusion experiment in an underground laboratory.

Kozima, loc. cit., has shown that atmospheric neutrons, produced by cosmic rays, are essential to achieve positive results.

Hadfield describes research by Yamaguchi *et al.*, reported in 1990, describing positive energy production results, and additional positive results have been published, including a paper in 2002.

Williams *et al.* report negative results, but it has been shown in a prestigious, mainstream, peer-reviewed journal that Williams *et al.* made mistakes in analyzing their results. Williams *et al.* did not dispute these criticisms.

Huizenga's view in all his publications is simply that positive results are all pathological science.

In a 1992 paper, Jones compared claims of excess heat and helium production with evidence of energetic nuclear particle emissions from deuterated solids, and initially concluded that there was no quantitative basis for connecting the two effects. However, his group is now using improved detectors and they report (Proc. 10^{th} Int. Conf. on Cold Fusion, Cambridge, MA, 2003) charged particle emission rates from TiH foils at 2 to 5 times background and greater than 70% repeatability, and they now conclude that these experimental results provide strong evidence for nuclear reactions occurring in the deuterided metals and are consistent with proton and triton production.

Kreysa *et al.* tested systems different from that of Professor Dash, such as platinized titanium expanded metal

sheet anodes, and a D_2O electrolyte containing Li_2SO_4 instead of LiOD.

Myers *et al* state that no evidence was found for radiation, but for some reason data for unannealed palladium is not included in Table 1. Figure 2 suggests that a positive result was obtained for this sample.

Rolison *et al.* conclude that the presence of certain elements at the electrode surface was due to diffusion from the palladium, which contained 50 ppm rhodium and 100 ppm silver. This conclusion is not valid because no information is given about the distribution of the rhodium and silver. The inventors (Dash et. al, Trans. Fusion Tech.**26**, 299-306(1994.) detected silver in localized microscopic spots where the surface was uplifted at concentrations of 50 atomic % or more, and such a distribution cannot be explained by a diffusion mechanism on the surface. This report also does not mention mass spectrometer data that lead them to conclude Pd-H_2O and Pd-D_2O systems have produced a number of unusual results involving a relative enrichment of m/z 106 that cannot be attributed to heretofore-identified plausible chemical interferents, i.e., the Rolison group had obtained evidence for a nuclear reaction after electrolysis with a palladium cathode as have the inventors. (D. Silver, Ph.D. dissertation, Portland State University, 1998)

Rousseau was not aware or did not consider the many positive, worldwide developments that occurred during the period reviewed.

Silvera and Moshary stated that they could not exclude the sample as the source of positive signals observed.

Taubes describes research at Texas A&M University, where tritium, a possible indicator of a nuclear reaction, was detected at high levels in experiments performed by the Bockris group. Taubes' book is based on information from a list of interviewed scientists, but such list (cited on pp. 475-480) does not include many of the most prominent scientists who published positive results on their research, including: Edmund Storms and Thomas Claytor of Los Alamos National Laboratory; Stanley Szpak and Pamela Mosier-Boss of the Navy laboratory in San Diego; Antoinette DeNinno and co-workers in Italy; Yan Kucherov and co-workers in Russia; and theoreticians such as Nobel prize winner Julian Schwinger and MIT professor Peter Hagelstein.

Taylor *et al.* detected tritium production in their research at Los Alamos, but no compelling evidence of neutron production was obtained underground, as is consistent with Kozima's theory.

Williams *et al.* were unable to duplicate the claims of cold fusion made by Fleischmann and Pons and by the Jones group, but their calorimetry was analyzed by Miles *et al.* (Melvin H. Miles et al., J. Phys. Chem. **98,** 1948(1994)), who concluded that calorimetric measurements involving Pd-D_2O electrolysis reported by several laboratories in 1989-1990 contained serious errors that undermine their reports of no excess power. The Miles' group has never received any rebuttal, neither from the Williams group nor from any scientist from the other laboratories whose work was criticized.

Wilson *et al.* observed no excess heat generation greater than 5% of the input energy, but this was because they were

not able to detect excess heat in 6 of 11 Fleischmann and Pons experiments where the excess thermal power was less than 250 milliwatts. Moreover, Fritz Will, a member of the Wilson group, later reported detection of tritium, a byproduct of cold fusion, at 50 times background, suggesting that the Wilson group report was premature

. WGBH-TV shows that positive results have come from approximately 100 labs, including Los Alamos.

APPENDIX D
USPTO POLICY CONCERNING COLD FUSION PATENT APPLICATIONS

It is commonly believed that the Patent Office rejects *per se* any patent application involving technology it labels as cold fusion. Bishop, *Some Scientists Press Search for Cold Fusion Despite Failure of '89*, Wall St. J., July 14, 1994, at 1 ("The U.S. Patent and Trademark Office routinely rejects any patent application that claims to involve cold fusion, putting it on a par with perpetual motion."); Dagani, *Latest Cold Fusion Results Fail to Win Over Skeptics*, Chem. Eng. News, June 14, 1993, 38, 41 ("'Work in the U.S. is lagging because the Patent Office refuses to issue patents' on cold fusion...."); Bishop, *A Bottle Rekindles Scientific Debate About the Possibility of Cold Fusion, Wall St. J.*, January 29, 1996, at A9B ("...the U.S. Patent and Trademark Office, which has flatly said that cold fusion, like perpetual motion, is impossible and unpatentable....").

To compare cold fusion with perpetual motion requires that the Office ignore approximately a thousand positive reports on cold fusion which have been published by scientists all over the world. This includes results obtained by highly respected scientists at the following U.S.

government laboratories: Los Alamos National Laboratory, Naval Research Laboratory, Naval Air Warfare Center Weapons Division (China Lake, CA), Space and Naval Warfare Systems Center (SSC San Diego), and Oak Ridge National Laboratory.

APPENDIX E

The following quotes Dr. Frank E. Gordon from SSC Technical Report 1862, vol. 1, p. iv, Feb. 2002: "As I write this Foreward, California is experiencing rolling blackouts due to power shortages. Conventional engineering, planned ahead, could have prevented these blackouts, but it has been politically expedient to ignore the inevitable. We do not know if Cold Fusion will be the answer to future energy needs, but we do know the existence of Cold Fusion phenomenon through repeated observations by scientists throughout the world. It is time that this phenomenon be investigated so that we can reap whatever benefits accrue from additional scientific understanding. It is time for government funding organizations to invest in this research".

SSC San Diego is a U.S. government laboratory which continues to perform cold fusion research, but the USPTO still maintains that cold fusion is impossible. Therefore, the Petitioner's efforts to obtain a patent on a cold fusion process has been a very expensive (in time and money), 15 year exercise in futility. The motivation for persisting in this effort is that it may hasten the day when the truth prevails. Then, young scientists who currently shun cold fusion may begin to participate in this research without fear of retribution.

APPENDIX F

FIG. 16 FROM TP8302

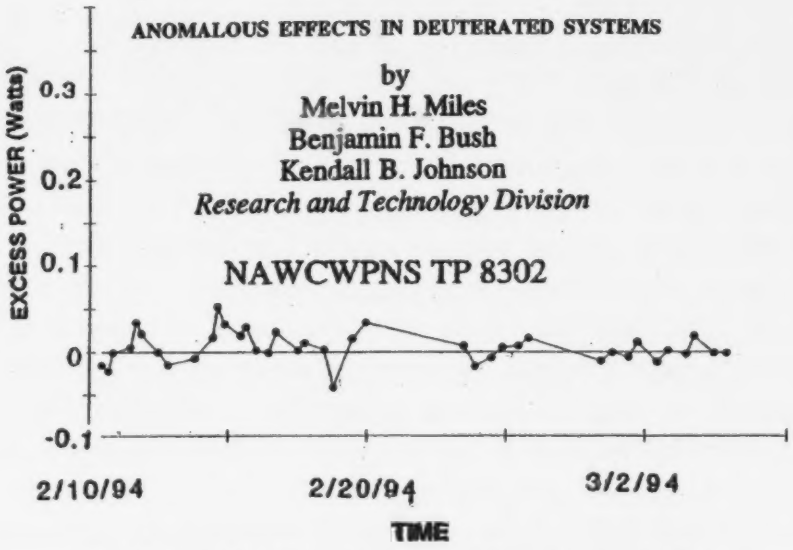

FIGURE 16. Excess Power Measurements for the John Dash Palladium Sheet Cathode, Cell B. All measurements are within ±40 mW. No excess power was observed.

SEPTEMBER 1996

NAVAL AIR WARFARE CENTER WEAPONS DIVISION
CHINA LAKE, CA 93555-6100

In the first six days there are eight data points above zero and four below, suggesting that excess heat was being produced.

APPENDIX G

Chemistry Department
University of LaVerne
1950 Third Street
LaVerne, California 91750
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Knowledge – Service - Vision

February 12, 2005

Professor John Dash
Department of Physics
Portland State University
Box 751
Portland, OR 97207

Dear Professor Dash:

I am writing this letter in support of your U.S. Patent application. It is my understanding that the U.S. Patent Office has inappropriately used my two studies of your system to reject your claims. This is totally wrong. In this field many detailed studies are required to support or reject claims. In my own experiments with the Navy over five years, only 28 out of 94 experiments produced the anomalous excess heat effect (see Table 10, p. 42 of NAWCWPNS TP8302, September, 1996). There are many variables that can affect results.

My two studies of your system had several serious flaws. Foremost was my use of Pt - 20% Rh as the anode material.

This anode worked fine in my D20+LiOD solutions, but it underwent obvious corrosion in your D20+H2SO4 system. This alone would likely cause my experiments on your system to fail. Furthermore, the use of your D2O+H2SO4 gave much higher electrolytic conductivity for the cell, thus the input powers that I used in this experiment were much lower than in all my other experiments. My calorimeter was much less accurate over this low input power range.

In reviewing the experimental results for this study (Figure 16, p. 66 of the NAWCWPNS TP8302 Report), there is possible evidence for small amounts of excess power over the first 5 or 6 days of this experiment. Apparently, the Rh dissolving from the anode and plating out on the Pd cathode over longer time periods sequenced these early signs of excess power. It should be noted that anomalous radiation was observed in these experiments (NAWCWPNS TP8302, p. 27).

Additional experiments should have been conducted to investigate these possible signs of excess power and anomalous radiation for your Pd/D2O+H2S0_4 system. Unfortunately, I was under contract with the Navy to investigate materials made by the Naval Research Laboratory (NRL) and could not devote any further time to studies of your system.

In summary, the U.S. Patent Office cannot use my two studies to make any ruling for or against your system.

Sincerely,

Dr. Melvin H. Miles
Visiting Professor
University of LaVerne

APPENDIX H

ICCF-11 PROGRAM ABSTRACTS, Marseille, France, 31 October – 5 November, 2004

Another Replication of Thermal Anomalies in "Dash" type Electrolytic Cells

Alessandro Zucca, Francesco Bonaraa, Angelo Salvatori, Anna Gandolfi. Liceo Scientifico "Leonardo da Vinci", Via *Respighi,* 5 20122, Milan, Italy

After the successful public demonstrations of thermal anomalies in electrolytic cells at Boston (ICCFIO) in 2003 and at Asti (5th Workshop) in 2004, we report a further replication at an Italian high school, "Leonardo da Vinci". One difference between this replication and the previous demonstrations is that we used "off the shelf' materials (i.e. virgin palladium) and we simply followed a written recipe. We hope these facts encourage others to carry out the experiment.

Method:The experimental arrangement is very similar to that used by John Dash. Two cells are connected in series (i.e. identical current in each). The control cell consists of platinum foil anode and cathode in H2SO4+H20. The experimental cell is the same but the cathode is palladium foil and the electrolyte is H2SO4+D20. Both cells use a catalyst to recombine the oxygen and isotopic hydrogen.

Results: On passing a current through the cells the temperatures both rise in much the same amount. At a certain point the experimental cell temperature accelerates and remains some 8-10 °C above that of the control cell. The duration of this anomaly appears to be dependent on current.

References:1 - Abhay Ambadkar and John Dash "Electrolysis of D2o With **A** Palladium Cathode Compared With Electrolysis Of H2O With A Platinum Electrode:

Procedure And Experimental Details". (Private Communication).
2- Franco Raverdino et al., "Fusione Fredda ad Asti.
L'esverienza di un liceo astigiano:' 5th Asti Workshop on anomalies in Hydrogen / Deuterium Loaded Metals 2004.

APPENDIX I [1]

With the assistance of professor Xing Zhong Li of Tsinghua University, Beijing, China, and professor John Dash of Portland State University, a new cold fusion research effort has begun at ChangChun University, ChangChun City. Dr. Jian Tian, dean of the school of biological sciences, directs the effort and oversees the work of eight undergraduate students working on cold fusion research. Tian has a background in material science.Tian invited Dash to ChangChun University in October of 2004 for a week to train students in his cold fusion recipe. Dash had recently trained high-school students at the Leonardo da Vinci scientific high school in Milan, Italy, on his simple but effective cold fusion demonstration. By the end of the week, the students had performed two successful cold fusion experiments. "The students stayed up all night preparing their graphs, and on Friday morning I walked into a packed lecture hall with a banner welcoming me," Dash said.The president and vice president of ChangChun University attended and were enthusiastic about the work, Dash reported. They asked him to suggest a reasonable amount of funds which would support professor Tian's group of cold fusion researchers. Xing Zhong Li later reported that Dash's suggestion had been approved: "The Vice-President in charge of research and foreign affairs promised the equivalent of US$100,000."

[1] **New Energy Times.com/news/NET9**

APPENDIX J

James A. Patterson U.S. Patents Related to Cold Fusion

Patent # **Title**

4,943,355. Improved process for producing uniformly plated microspheres, issued 7-24-1990.

5,036,031. Metal plated microsphere catalyst, issued 7-30-1991.

5,318,675. Method for electrolysis of water to form metal hydride, issued 6-7-1994.

5,372,688. System for electrolysis of liquid electrolyte, issued 12-13-1994.

5,494,559. System for electrolysis, issued 2-27-1996.

5,580,838. Uniformly plated microsphere catalyst, issued 12-3-1996.

5,607,563. System for electrolysis, issued 3-4-1997.

5,616,219. System and method for electrolysis and heating of water, issued 4-1-1997.

5,618,394. System and electrolyte cell having inert spherical core catalytic elements for heating a liquid electrolyte, issued 4-8-1997.

5,628,886. Electrolytic system for heating a liquid electrolyte, issued 5-13-1997.

5,628,887. Electrolytic system and cell, issued 5-13-1997.

5,632,871. System and electrolytic cell having pure metal catalytic elements for heating a liquid electrolyte, issued 5-27-1997.

APPENDIX K

CURRENT DoE POLICY ON COLD FUSION [1].After 16 years, it's back. In fact, cold fusion never really went away. Over a 10-year period from 1989, US navy labs ran more than 200 experiments to investigate whether nuclear reactions generating more energy than they consume - supposedly only possible inside stars - can occur at room temperature. Numerous researchers have since pronounced themselves believers. With controllable cold fusion, many of the world's energy problems would melt away: no wonder the US Department of Energy is interested. In December, after a lengthy review of the evidence, it said it was open to receiving proposals for new cold fusion experiments. That's quite a turnaround. The DoE's first report on the subject, published 15 years ago, concluded that the original cold fusion results, produced by Martin Fleischmann and Stanley Pons of the University of Utah and unveiled at a press conference in 1989, were impossible to reproduce, and thus probably false.The basic claim of cold fusion is that dunking palladium electrodes into heavy water - in which oxygen is combined with the hydrogen isotope deuterium - can release a large amount of energy. Placing a voltage across the electrodes supposedly allows deuterium nuclei to move into palladium's molecular lattice, enabling them to overcome their natural repulsion and fuse together, releasing a blast of energy. The snag is that fusion at room temperature is deemed impossible by every accepted scientific theory.That doesn't matter, according to David Nagel, an engineer at George Washington University in Washington DC. Superconductors took 40 years to explain, he points out, so there's no reason to dismiss cold fusion. "The experimental case is bulletproof," he says. "You can't make it go away."

[1]New Scientist magazine, March 19, 2005, p. 30.

OCT 28 2005
OFFICE OF THE CLERK

No. 04 - 1573

In The

Supreme Court of the United States

John Dash, *Petitioner*

v.

Patent and Trademark Office
Respondent

On Petition for a Rehearing
of an Order Denying a Writ of Certiorari
To United States Court Of Appeals
For The Federal Circuit
04-1145
(Serial No. 08/439,712)

IN RE JOHN DASH

Appeal from the Board of Patent Appeals

And Interferences

(No. 1998-1918)

PETITION FOR A REHEARING OF AN ORDER DENYING A WRIT OF CERTIORARI

John Dash, Ph.D.

313 N. Holman St.

Portland, OR 97217

October 28, 2005

Phone: 503-725-4222

Petition for rehearing on : John Dash
v. Patent and Trademark Office
No. 04-1573

In our petition for a writ of certiorari to the United States Court of Appeals for the Federal Circuit, 04-1145, it was shown that the Patent and Trademark Office (PTO) has granted 12 patents on an invention directed toward the production of heat by a process called cold fusion, even though the inventor scrupulously avoided any mention of this process because of the PTO policy that cold fusion is not credible and therefore not patentable. It was also shown that the petitioner was denied a patent on a similar invention with an earlier filing date, before the PTO policy was made known. The reason for the denial appears to be that the petitioner and the co-inventor suggested that the heat detected was produced by low temperature nuclear fusion, commonly known as cold fusion.

Cold fusion is a multifaceted phenomenon which is poorly understood. This was recognized by the 2004 DoE review of cold fusion research over the past 15 years. The 18 reviewers almost unanimously recommended that the DoE should support well- designed proposals to study the materials science of cold fusion materials and the radiation emitted during cold fusion experiments. No longer is cold fusion in the same category as perpetual motion, i.e. incredible. The purpose of this petition is to provide additional evidence of the dysfunctional PTO policy on cold fusion which has hindered rather than promoted the progress if science, and which has denied many inventors the recognition which patents provide, and which motivate investors to provide funding to reduce new discoveries to practice. This PTO policy is at least partly responsible for denying a whole generation of students any introduction to the facts of cold fusion which have been discovered through experiments performed all over the world. It is also at least

partly responsible for inhibiting progress on a possible new energy source which could help to decrease the rate of global warming and also help the U.S. to achieve energy independence.

A recent computer search of the PTO patent data base was conducted using the search terms ***cold fusion***. Thirty patents were listed by the computer. These will be reviewed below, to the extent that this is possible, given the limited space allowed for this petition.

1. **Patent No. 4,968, 395**, issued on November 6, 1990.
Title: Method and apparatus for increasing catalytic efficiency of electrodes
Inventors: R. Pavelle, P. Burstein, and L. Ferber
Abstract: A catalytic process and apparatus has at least one electrode composed of catalytic material. An electric current is applied to at least one electrode which is mechanically manipulated to increase the operating efficiency thereof during application of the electric current.
Primary Examiner: T.M. Tufariello

Comments: There is no mention of cold fusion or any other nuclear process in the title or abstract. Presumably the invention has universal applicability to a variety of processes, including cold fusion.

2. **Patent No. 5,318, 675,** issued on June 7, 1994.
Title: Method for electrolysis of water to form metal hydride
Inventor: J.A. Patterson
Abstract: An electrolytic cell and method of electrolysizing and heating water containing a conductive salt in solution. The electrolytic cell includes a non-conductive housing having an inlet and an outlet and spaced apart first and second conductive foraminous

grids connected within the housing. A plurality of non-conductive microspheres each having a uniformly thick outer conductive palladium layer thereon are positioned within the housing in electrical contact with the first grid adjacent the inlet. An electric power source is operably connected across the first and second grids whereby electrical current flows between the grids within the water solution.
Primary Examiner: D.R. Valentine

Comments: The words cold fusion or nuclear do not appear in the title or abstract, but it is quite clear that metal hydrides are being produced to aid in heating a liquid during electrolysis. There is no attempt to explain the origin of the heat, but the invention is obviously a variation of the system used by Pons and Fleischmann for which they claimed to produce nuclear fusion at low temperatures.

Patterson received a total of 13 patents on his inventions related to cold fusion . The words ***cold fusion*** or ***nuclear*** do not appear in any of these. There is no attempt to explain the origin of the heat reported in any of these patents. D.R. Valentine was the primary examiner on nine of these patents.

3. Patent Nos. 5,411,654, 5,674,632, and 5,770,036, issued on May 2, 1995, October7,1997, and June 23,1998, respectively.
Title: Method of maximizing anharmonic oscillations in deuterated alloys
Inventors: B.S. Ahern, K.H. Johnson, and H.R. Clark, Jr. **Abstract**: For a condensed matter system containing a guest interstitial species such as hydrogen or its isotopes dissolved in the condensed matter host lattice, the invention provides tuning of the molecular orbital degeneracy of the host lattice to enhance the

anharmonicity of the dissolved guest sublattice to achieve a large anharmonic displacement amplitude and a correspondingly small distance of closest approach of the guest nuclei. The tuned electron molecular orbital topology of the host lattice creates an energy state giving rise to degenerate sublattice orbitals related to the second nearest neighbors of the guest bonding orbitals. Thus, it is the nuclei of the guest sublattice that are set in anharmonic motion as a result of the orbital topology. This promotion of second nearest neighbor bonding between sublattice nuclei leads to enhanced interaction between nuclei of the sublattice. In the invention, a method for producing dynamic anharmonic oscillations of a condensed matter guest species dissolved in a condensed matter host lattice is provided. Host lattice surfaces are treated to provide surface features on at least a portion of the host lattice surfaces; the features have a radius of curvature less than 0.5 microns. Upon dissolution of the guest species in the treated host lattice in a ratio of at least 0.5, the guest species undergoes the dynamic anharmonic oscillations.
Primary Examiner: D.R. Valentine

Comments: All three patents have the same title and abstract, in which the words ***cold fusion*** and ***nuclear fusion*** do not appear, but it is very clear that the purpose of the invention is to stimulate nuclear fusion at low temperature.

Patent No. 5,729,580, issued March 17, 1998
Title: Hydrogen ion array acceleration generator and method
Inventor: G.L. Millspaugh
Abstract: A novel hydrogen ion array acceleration generator and method are presented wherein there is provided along a transversely extending diffusion/emission grid surface and within an evacuated

contained environment, an array of hydrogen ions at the interstitial sites of the grid surface; such being electrically accelerated along a longitudinal direction substantially normal to said surface toward a transversely extending lattice surface of a heavy metal of atomic radius between about 1.23 and 1.31 Angstroms, and with matching of the interstitial sites on said grid surface with corresponding interstitial sites on the surface of said target lattice so as to bombard ions that may be already positioned at the corresponding target lattice surface interstitial sites; or, to penetrate into the target lattice to impact the hydrogen ion array pre-positioned in corresponding target lattice interior interstitial sites; or to insert an ion into such interior interstitial sites of the target lattice for future reaction with a bombardment ion. **Primary Examiner**: D.D. Wasil

Comments: Here again is another patented invention designed to stimulate ***nuclear fusion*** at low temperature, but there is no mention of ***nuclear*** or ***fusion*** in the title or abstract.

Patent No. 5,659,173, issued August 19, 1997.

Title: Converting acoustic energy into useful other energy forms **Inventors:** S.J. Putterman, B.P. Barber, R.A. Hiller, and R.M.J.Lofstedt

Abstract: Sonoluminescence is an off-equilibrium phenomenon in which the energy of a resonant sound wave in a liquid is highly concentrated so as to generate flashes of light. The conversion of sound to light represents an energy amplification of eleven orders of magnitude. The flashes which occur once per cycle of the audible or ultrasonic sound fields can be comprised of over one million photons and last for less 100 picoseconds. The emission displays a clocklike synchronicity; the jitter in time between consecutive

flashes is less than fifty picoseconds. The emission is blue to the eye and has a broadband spectrum increasing from 700 nanometers to 200 nanometers. The peak power is about 100 milliWatts. The initial stage of the energy focusing is effected by the nonlinear oscillations of a gas bubble trapped in the liquid. For sufficiently high drive pressures an imploding shock wave is launched into the gas by the collapsing bubble. The reflection of the shock from its focal point results in high temperatures and pressures. The sonoluminescence light emission can be sustained by sensing a characteristic of the emission and feeding back changes into the driving mechanism. The liquid is in a sealed container and the seeding of the gas bubble is effected by locally heating the liquid after sealing the container. Different energy forms than light can be obtained from the converted acoustic energy. When the gas contains deuterium and tritium there is the feasibility of the other energy form being fusion, namely including the generation of neutrons.

Primary Examiner: G.Y. Epps

Comments: Sound energy is converted into light energy. There is an amplification of 11 orders of magnitude. This is only possible from a nuclear reaction which, in this case, apparently occurs close to ambient temperature, i.e., cold fusion. The last sentence mentions the possibility of fusion. Recent peer-reviewed research claims to produce fusion in similar experiments.

6. Patent No. 5,734,122, issued March 31, 1998

Title: Thermoelectric energy conversion apparatus
Inventor: H. Aspden
Abstract: Apparatus is disclosed in which a pair of elongated solid cylindrical metal conductors mounted with their central axes mutually parallel are

connected at their ends to form a closed electrical circuit path, there being heat sinks at spaced positions along their length which serve as heat transfer means setting up a temperature gradient along the lengths of the conductors. A strong electrical current flow in the conductors creates a circumferential magnetic field in the metal directed at right angles to the heat flow and this, by the Nernst Effect, produces a radial electric field gradient in the metal coupled with the transient accumulation of stored electrical energy. The apparatus disclosed serves for the experimental testing of energy conversion and storage by thermoelectric processes occurring in the metal and the ultimate utilization of the technology involved.

Primary Examiner: K.L. Gorgos

Comments: This invention is designed to convert heat into electricity. Although it has obvious applications to cold fusion, there is no mention of ***cold fusion*** or a ***nuclear*** process in the title or abstract.

7. Patent No. 5,942,206, issued August 24, 1999

Title: Concentration of isotopic hydrogen by temperature gradient effect in soluble metal

Inventors: H.S. Uhm and W.W. Lee

Abstract: Isotopic hydrogen enrichment in a soluble metal is achieved through temperature gradient effects by applying a heat source and a heat sink to two spaced regions of the metal within which isotopic hydrogen atoms are absorbed and enclosed by a diffusion-barrier material. The temperature gradient so created forces the atoms of hydrogen in the hot region to migrate into the cold region, resulting in higher isotopic hydrogen density in the cold region. Discharge of the absorbed isotopic

hydrogen is prevented effectively by the diffusion-barrier material. **Primary Examiner**: D.D. Wasil
Comments: This is another invention designed to produce conditions to increase the probability that cold fusion occurs. However, there is no mention of ***cold fusion*** or ***nuclear fusion*** anywhere in the 11 pages of the document.

8. Patent No. 6,024,935, issued February 15, 2000

Title: Lower-energy hydrogen methods and structures
Inventors: R.L. Mills, W.R. Good, J. Phillips, and A. Popov
Abstract: Methods and apparatus for releasing energy from hydrogen atoms (molecules) by stimulating their electrons to relax to quantized lower energy levels and smaller radii (smaller semimajor and semiminor axes) than the "ground state" by providing energy sinks or means to remove energy resonant with the hydrogen energy released to stimulate these transitions. An energy sink, energy hole, can be provided by the transfer of at least one electron between participating species including atoms, ions, molecules, and ionic and molecular compounds. In one embodiment, the energy hole comprises the transfer of t electrons from one or more donating species to one or more accepting species whereby the sum of the ionization energies and/or electron affinities of the electron donating species minus the sum of the ionization energies and/or electron affinities of the electron accepting species equals approximately mX27.21 eV (mX48.6 eV) for atomic (molecular) hydrogen below "ground state" transitions where m and t are integers. The present invention further comprises a hydrogen spillover catalyst, a multifunctionality material having a functionality which dissociates molecular hydrogen to provide free hydrogen atoms which spill over to a functionality which supports mobile free hydrogen atoms and a functionality which

can be a source of the energy holes. The energy reactor includes one of an electrolytic cell, a pressurized hydrogen gas cell, and a hydrogen gas discharge cell. A preferred pressurized hydrogen gas energy reactor comprises a vessel; a source of hydrogen; a means to control the pressure and flow of hydrogen into the vessel; a material to dissociate the molecular hydrogen into atomic hydrogen, and a material which can be a source of energy holes in the gas phase. The gaseous source of energy holes includes those that sublime, boil, and/or are volatile at the elevated operating temperature of the gas energy reactor wherein the exothermic reaction of electronic transitions of hydrogen to lower energy states occurs in the gas phase.

Primary Examiner: W. Langel

Comments: Mills and co-workers propose a non-nuclear explanation for anomalous heat detected during the electrolysis of water. However, the work of others on the same experiment (Trans. Fusion Technology **26,** 205(1994) and ibid. p. 344) indicates that a nuclear process produces the heat.

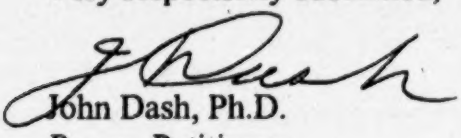
The eight patents reviewed above and the 22 other patents listed by the PTO computer in the category ***cold fusion*** all have in common that they are directed toward the production of energy. Hydrogen plays an important role in all of these. There is no consensus within the scientific community on a mechanism to explain the origin of this energy. However, this is not unusual in science. For example, high temperature superconductivity was discovered in 1986, and the Nobel Prize in physics was awarded for this discovery in 1987. There are now practical applications, such as magnetic resonance imaging, a very important diagnostic tool in medicine. However, there is still no complete theory to explain the origin of high temperature superconductivity. From the beginning high temperature superconductivity was not controversial because reproducibility was very

good. Scientists all over the world began to study it. The effort was comparable to the effort put forth in the Manhattan Project during World War II. On the other hand, reproducibility in cold fusion experiments was very poor. Most scientists who tried these experiments were not successful, but several hundred scientists around the world were successful. About 200 of these continued their research, despite difficulties such as lack of funding and the disdain of their peers.

The PTO rightfully has been very conservative about granting patents on cold fusion, especially because the mainstream scientific community has been unwilling to accept the claim that a new phenomenon has been discovered. However, 30 patents with claims related to cold fusion have been granted. What these patents have in common is that they do not mention any relationship to cold fusion or any other nuclear process. The eight patents reviewed above were approved by six different examiners. From discussions with colleagues in the community of scientists who study cold fusion, the petitioner concludes that those applications which explained results obtained in terms of cold fusion or another nuclear process such as transmutation most probably were all sent to H. Behrend, who denied every one. The petitioner, therefore concludes that the PTO policy is not uniform and should be changed. Mistakes which were made (e.g., denial of a patent because the title of the application is "Low Temperature Nuclear Fusion") should be corrected. Therefore, we respectfully request a rehearing of the order denying a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit, 04-1145 (Serial No. 08/439,712).

This is to certify that this petition for rehearing of No. 04 – 1573 is presented in good faith and not for delay. A large body of pertinent information which was discovered recently is discussed.

Very respectfully submitted,



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Pro se, Petitioner